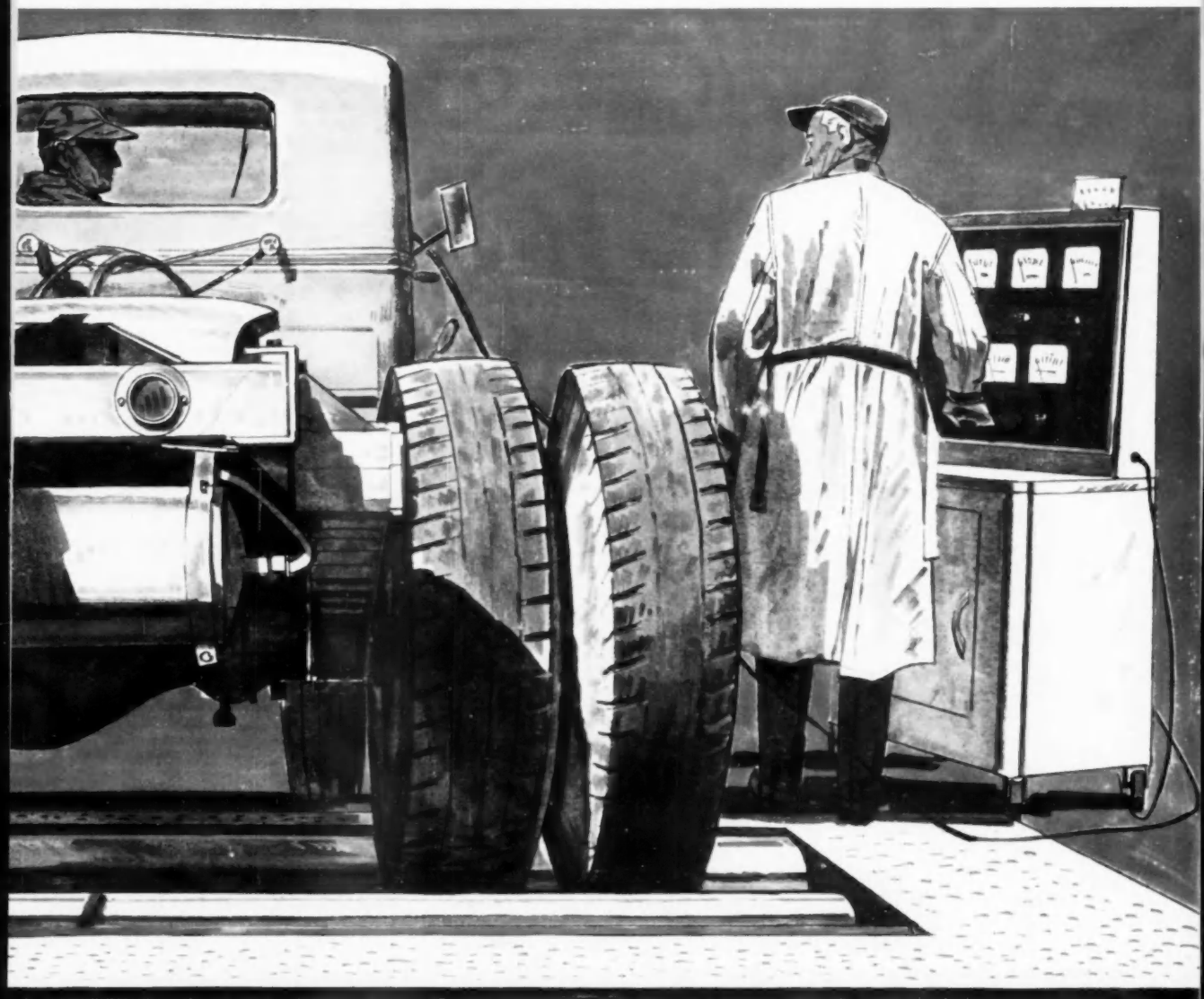
JULY 1957

CCJ COMMERCIAL CAR JOURNAL

A CHILTON PUBLICATION

THE MAGAZINE FOR TRUCK AND BUS FLEET OPERATORS



about engines

- NTTC Meeting Discusses Five Types
- SAE Considers Economics of Diesels
- Instruments Check Their Efficiency

In actual road tests . . .

Dodge takes first place in responsive performance . . . and this means greater safety for you. In actual road tests of acceleration between comparable models of all three low-priced trucks, Dodge led the field by five lengths. It's graphic proof that only a *Power Giant* Dodge gives you the extra power to pass everyday traffic with an added margin of safety.

and on your job . . .

Dodge gives you more V-8 power, in every weight class, than either of the other two low-priced trucks. From 204-hp. pick-ups to 232-hp. tandems, the extra power you get in a Dodge means an on-the-job performance bonus for you. It means greater economy, too, because it cuts down engine strain, reduces wear and repairs.

Dodge *Power Giants* outpower, outperform the "other two" low-priced trucks by wide margin!

Want power? Dodge outpowers its low-priced competitors by as much as 27 percent.

Want economical performance? The advanced design of the Dodge short-stroke V-8 produces the most efficient fuel usage in the industry. You get more miles per gallon . . . full power on *regular gas*.

Want extra payload capacity and handling ease? Dodge has 'em beat on both counts.

How about it? Don't you think you should find out for yourself? Just give your Dodge dealer a ring. He'll bring a truck right to your door and he'll show you certified test results that demonstrate Dodge is a winner in actual tests and on your job.

DODGE

PowerGiants

MOST POWER OF THE LOW-PRICED 3

More Deliveries for Less Money

EXTRA FEATURES WITHOUT EXTRA COST!

Dent Protection: 1/8"-thick side panels, skirts, rub rails and rear panels . . . **Rugged Rear Bumper** and step extend rearward 10 inches . . . E-Z Eye Safety Glass in extra high panoramic windshield . . . Wide Side Doors—31" clearwidth and roller-type windows, both sides . . . **Flat-Top Engine Cover** and **Square Wheel Boxes** . . . 73 1/8"-high **loadspace** with choice of 38" or 58" Rear Doors 60 5/8" high (full-width doors 64" high on option) all with or without windows . . . **3 Storage Compartments . . . Insulated Roof** including cab . . . two heavy-duty windshield wipers, dome spotlight, 4 reflectors, rear-view mirror . . . Hinged access to radiator and gas-tank filler cap . . . **Underbody Protected** with Aerotype Bitumastic.

Aluminum Bodies by Grumman are higher and bigger—they save time and fatigue and increase delivery volume.

You get more for your money when you buy them and then get your money back thru Savings, Longer Life and Higher Resale Values.

Their thick Aluminum panels weigh less, dent less and corrode less. Less deadweight saves gasoline, tires, brakes, clutches, springs, bearings and engine strain. Rugged rear bumpers extending back 10 inches are real protection. Loadspace is actually manhigh—73 1/8". And 78" wide in 5 lengths—8', 10', 12', 14' and 15'. At Chevrolet, Ford, GMC and Dodge dealers.

OLSON KURB SIDE

New Book of Delivery Facts on Request **J. B. E. Olson Corporation, 1740 Broadway, New York 19, N. Y.**

COMMERCIAL CAR

—JULY 1957 • Vol. 93 • No. 5—

This Month's Features • • •

Departments • • •

ON THE COVER . . .
Queen of all shop instruments, the chassis dynamometer provides a complete indoor proving ground. But other test equipment will do big jobs for you too. For proof: page 85. And if you'd just as soon keep your rigs out of the shop as much as possible, don't miss the articles about engines, oil analysis, electrical units and diesels on pages 66, 70, 72 and 78. See details above.

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BPA NBP

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Commercial Car Journal . . .

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"My new rig has a full-depth Airfoam seat—so the Boss made me change places with him!"

Airfoam—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

How full-depth AIRFOAM seats ▶ increase driver-efficiency, cut costs:

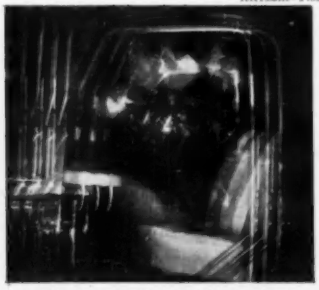
You can specify Full-Depth AIRFOAM *seats and backs as original equipment on any truck! But be sure it's*

Airfoam

MADE ONLY BY

GOODYEAR

The World's Finest, Most Modern Cushioning



MULTIPLE-EXPOSURE PHOTO showing how ordinary cushions *amplify* drags and jars, cause driver to bounce up as controls come down. Trying to compensate, driver cramps muscles, frazzles nerves, drains efficiency. Cushions wear out, too!

SAME CAB. AIRFOAM (with over half-a-million fresh air cushions per cubic inch) *muffles* and absorbs drags and jars, keeps driver's motion in step with controls. Result: Fresher, happier, more efficient drivers—plus undamaged cushions!

Goodyear, Automotive Products Dept., Akron 16, Ohio

THE OVERLOAD

EDITORIAL COMMENT

Trucks Keep the Forest Primeval

WE RECEIVED a most intriguing letter the other day. There seemed to be smoke in the atmosphere when it came in, and—when a sprig of Cedar fell out—we knew it was something out of the ordinary.

The lengthy letter can be summed up in a few words: Trucks are ruining our forests . . . therefore trucks are no damn good and a plague on all their houses including manufacturers, users and suppliers.

The letter would hardly be worth mentioning except that it is so typical of the goofy misconceptions that so often surround the trucking industry. Its timing was perfect. Our June issue had just gone to press with its lead feature about Kaibab Lumber Co. (located on the brim of the Grand Canyon). Thanks to the extensive research on that article, we have more than a passing knowledge of just what does go on in a modern "tree farming" operation.

The fact and fantasy surrounding the letter writer's misconception might well come in handy the next time you meet a "truck-hater." Here's how it works out.

Fantasy: The letter writer lives near a great forest. He is vitally and rightly interested in preserving the nation's timberland. Every day he looks out and sees the great trucks hauling tons of lumber past his door. Pretty soon—he reasons—it will be all used up. Therefore, damn those trucks. They will ruin the forest.

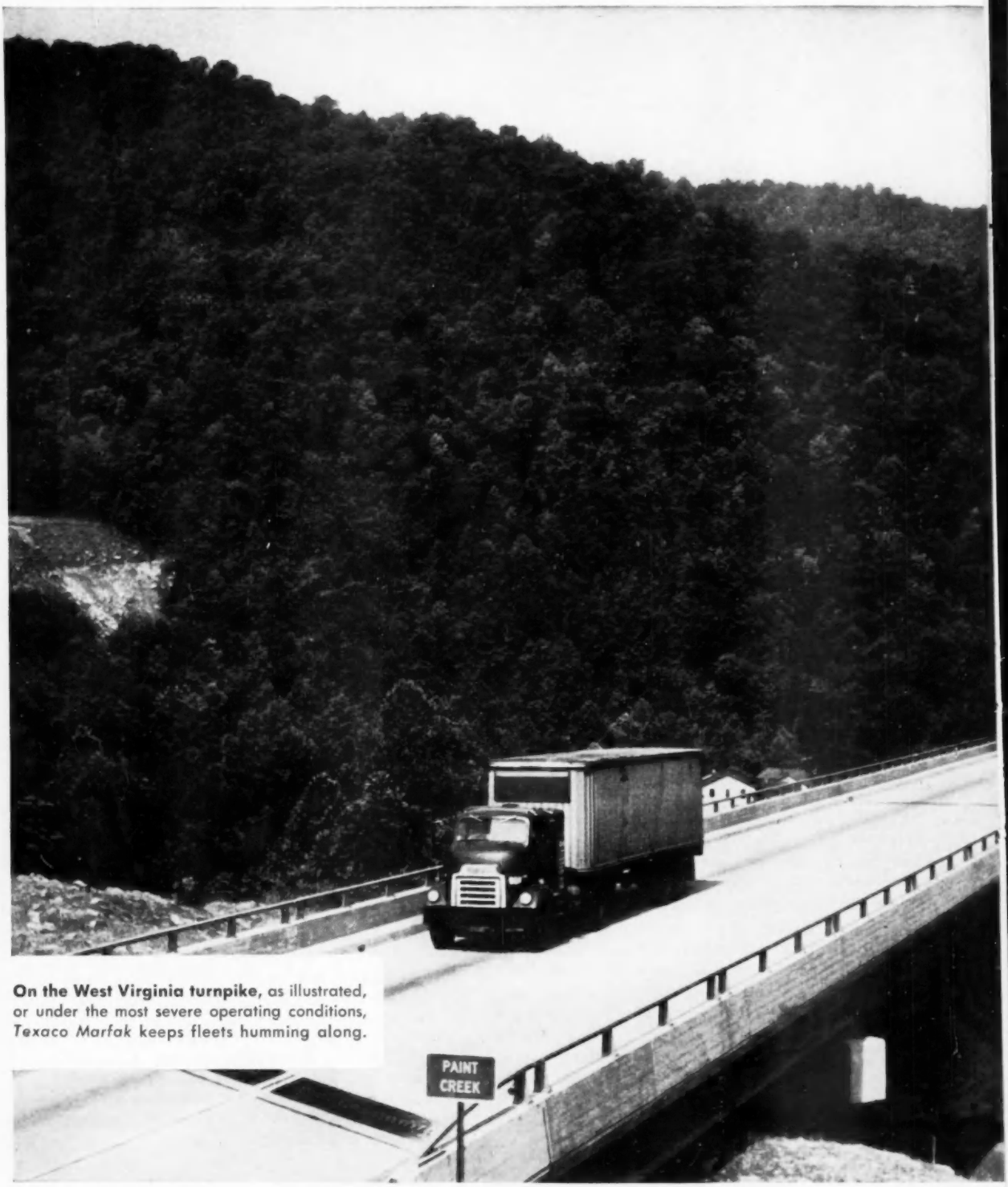
Fact: *Because* of the trucks, the forest lives on! To see why, we must go back a generation when logging was a far different story. In the "olden" days, the logger would buy cutting rights on a particular tract of land. By necessity this land was always near a railroad or preferably a river. The operator would then proceed to strip the land bare of timber, shipping the product of his toil by rail or water. There was nothing left of the tract but rubble, and the logger would move on to another area.

But thanks to the mobility of a nation on wheels this is no longer an economic necessity. With his trucks, the crane loaders, the power saws and skidding arches, the logger now moves deep into the forest. As in the case of Kaibab Lumber Co., he may be 50 miles from the nearest highway, more than 100 from the nearest railhead and have no waterway at all.

Building his own roads as he goes, the logger picks and chooses only the best of the crop. Often it is only one or two trees to an acre. And, as these older trees are culled out, more breathing space is created for the younger growth. Truly the forest lives on, better and healthier than before.

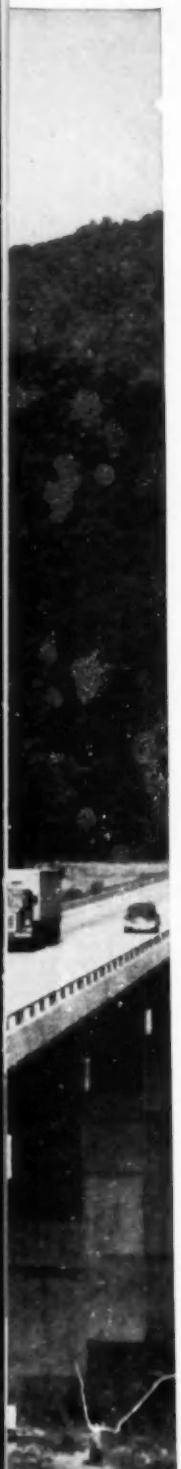
Here then is just one more example of how the trucking industry serves the very core of America's economy. Yet it remains one of the most maligned and misunderstood industries of all time. It's up to all of us to cull out the fantasy and keep the facts alive.

Bart Rawson
Editor



On the West Virginia turnpike, as illustrated, or under the most severe operating conditions, *Texaco Marfak* keeps fleets humming along.

TEXACO



For smoother operation and lower maintenance costs

--Texaco Marfak

When your truck or bus fleet uses *Texaco Marfak*, you can be sure of this—

In chassis, *Texaco Marfak* provides a near-perfect seal against road grit and moisture, prevents rust and wear. It cushions bearings against pounding, minimizes the effect of body jarring.

In wheel bearings, *Texaco Marfak Heavy Duty 2* makes for a smoother ride as it protects vital parts against wear and rust. Parts last longer, maintenance is reduced. No seasonal change is required.

For a multi-purpose lubricant, *Texaco Marfak Heavy Duty Special 2* —a lithium base grease—provides excellent all around protection.

More than 650 million pounds of Texaco Marfak has been sold.

Texaco D 303 Motor Oil HD—fully detergent and dispersive—keeps diesel and heavy duty gasoline engines running smoothly and clean over longer periods between overhauls. It assures the full compression and complete combustion that invariably lower fuel bills.

In differentials and transmissions, *Texaco Universal Gear Lubricant EP* eliminates friction-drag between meshing, rotating parts and cuts maintenance costs.

Texaco Lubrication Engineers are trained to help fleet owners pare operating and maintenance costs through the proper use of lubricants. Just call the nearest Texaco Distributing Plant; there are more than 2,000 in the 48 States. Or, write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, New York.

Lubricants and Fuels

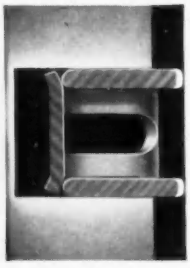
FOR TRUCK AND BUS FLEETS

This new piston ring is setting the AUTOMOTIVE WORLD on its ear!

Sealed Power's Stainless Steel Oil Ring

Does things no other ring can do

SHOP MEN SHOULD KNOW THESE FACTS...



Proper axial pressure of the ring side rails against the sides of grooves assures side-sealing—even under difficult high vacuum conditions of deceleration.

•

Circumferential abutment type design makes the ring independent of contour and depth of piston groove. The SS-50U exerts pressure uniformly . . . conforms more readily to the cylinder bore.

Holds full tension at engine operating temperature • resists corrosion • won't sludge • actually hardens in use • chrome-plated steel rails for more than double normal life • seats instantly.

SEALED POWER CORPORATION • MUSKEGON, MICHIGAN

Sealed Power Piston Rings

BEST FOR RE-RING! BEST FOR RE-BORE!

CCJ AT YOUR SERVICE

TIMELY NOTES ON MAINTENANCE AND OPERATION Edited by Paul A. Murphy, Technical Editor

What Done It?

THIS PISTON was damaged when the mechanic failed to line-up the piston pin properly and exerted excess pressure on the lock screw in an attempt to force the pin into proper alignment. The manufacturer's service instructions for installing this type of piston pin are to heat the piston (not the pin) in boiling water, apply graphite grease to inside of pin bosses, and press pin into piston "hand tight" as far as possible. Then use a soft driving tool to tap the pin into position, so that the tapered hole in piston pin will line up with threaded hole in piston boss. Tighten lockscrew to 9-11 ft-lb torque.

Caution: If hole in pin is not accurately aligned with hole in piston boss, the taper of the set screw will wedge against the taper of the hole in pin. This will set up a severe strain on the piston boss which may lead to piston breakage.

Safety Hint on Fire Prevention

INSTRUCT YOUR drivers to keep all loose inflammable material such as road maps, waybills, lunch bags, oily rags, rope or twine, etc. out of truck cabs and from behind the driver's seat. We observed a vehicle that the insurance company wrote off as a total loss due to an internal cab fire. Driver reported that the fire started from a shorted wire under the dash, spread to burn up all seats, floor mat and complete interior of the cab.

By the outside appearance, the fire could have started behind the driver's seat. The fleet superintendent indicated that the possible cause of the fire was the inflammable material that was thrown behind the driver's compartment It was noted that the vehicle battery was still fully charged.

Detonation Complaints

IN DETONATION complaints, the distributor advance should be tested—either on the vehicle with the tune-up tester or, better still, by removing the distributor and testing the advance on the distributor tester. The distributor advance should be recalibrated if required. Then set the initial timing to the manufacturer's recommended setting. If detonation still occurs after road testing, change to gasoline of higher octane rating It is not recommended to retard initial timing beyond the manufacturer's recommended setting as the performance loss might be objectionable.

If the vehicle is used mostly in city traffic, it is sometimes helpful to take the vehicle out on the highway and drive it at higher speeds for several miles. This will frequently burn off and blow out excessive carbon deposits (known as blowing out the bugs). If pinging still persists a carbon removal operation is necessary.

We experienced a similar complaint on one of our cars, where it seemed that only three cylinders were going into audible detonation. First the timing was dropped back to a point

(TURN TO PAGE 12, PLEASE)

"IT'S THE MOST.."

Wagner Lockheed

the best known name in brake service

. . . and costs you less in long run

Wagner® Lockheed

HEAVY DUTY BRAKE LINING

The popular slang expression, *"it's the most"*, definitely applies to Wagner Lockheed—the heavy-duty lining that has the most of everything . . . most in balanced quality . . . most in coverage . . . most in proven performance . . . most for the money . . . most for perpetuating good, safe brakes. You can't beat it! . . . it's tops for quality.

Reline with this safety-proven Wagner Lockheed brake lining. It is engineered to meet the rigid demands of modern over-the-road driving. It is unsurpassed for quick, safe, smooth stops.

You'll like the long-wearing qualities of Wagner Lockheed brake lining. It wears slowly and evenly, and brakes require fewer adjustments even though exposed to heavy-duty service under severe driving conditions.

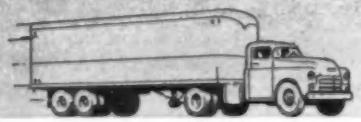
This top-quality lining is uniform in density, composition, and frictional qualities throughout its entire service thickness . . . will not compress, absorb moisture, or deteriorate with age. Contains no harmful abrasive materials to damage drums.

Wagner Lockheed lining and blocks are available in hundreds of different sets, and slabs are made in combinations of radius, thickness and width for application on practically every heavy-duty vehicle brake.

You can benefit, too, by buying all your brake service needs—Wagner Lockheed Hydraulic Brake Parts, Fluid and Lining—from one dependable source.

EXCHANGE SHOE SETS save you time and money. They are relined with Wagner approved lining—riveted or bonded. For details on complete line—including Wagner Lockheed Brake Parts and Fluid—write for Catalog AU-1.

WAGNER LOCKHEED BRAKE PARTS,
FLUID AND LINING...AIR BRAKES...AIR HORNS...
TACHOGRAPHS...NOROL...ELECTRICAL PRODUCTS



857-2

Wagner Electric Corporation
6470 Plymouth Ave. • St. Louis 14, Mo.
(Branches in principal cities in U. S. and in Canada)

Please send me a FREE copy of Catalog AU-1.

NAME _____

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CCJ AT YOUR SERVICE

Continued from Page 9

where the vehicle was "lazy", and still the detonation was present. Next, all spark plugs were removed and tested, also the distributor assembly was removed and checked on a distributor tester. Finally both cylinder heads were removed and carbon cleaned and acting on factory recommendations, we installed .040 head gaskets.

The vehicle performance returned to normal, and engine idle characteristics were improved. It is believed that three of the cylinders were above normal in compression ratio, and that this was the cause of the detonation. By installing a heavier head gasket, the top performance of the engine was sacrificed slightly to accommodate the above normal cylinders.

Fuel Volatility Ratings

AT A RECENT National Petroleum Assn. meeting in Cleveland, a variety of fuel blending problems were discussed. One refiner —analyzing users' complaints over a period of 10 years—pointed out that its big problem currently is in performance characteristics, mainly warm-up and acceleration. Refiners feel that vapor lock is not a serious problem. Hence they lean toward increased volatility.

Engine designers, on the other hand, are pleading for more conservative volatility ratings to accommodate high temperatures under the hood. Lower hood lines and more power-absorbing devices, tend to raise under-hood temperatures. Engine designers say the only reason vapor lock is not a problem is that carburetors have been carefully vented — one model has 14 vents.

Exhaust System Deterioration

ON MODERN ENGINES the exhaust system runs cooler than older type engines, and the muffler does not get hot enough to boil the moisture out, so consequently in the case of a short run, the muffler does not get hot enough (212 deg) to boil out the moisture. With new chemicals being added to gasoline to increase octane and give other operating advantages, stronger acids are formed when mixed with condensation in the muffler. This also adds to exhaust system deterioration.

Dual exhaust systems do cause a little faster deterioration. Exhaust heat is divided between

(TURN TO PAGE 16, PLEASE)

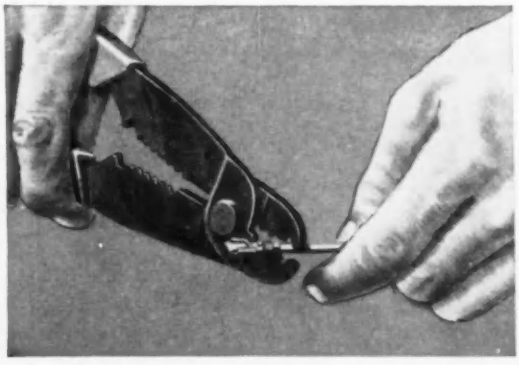
OUT OUR WAY **by J. R. Williams**

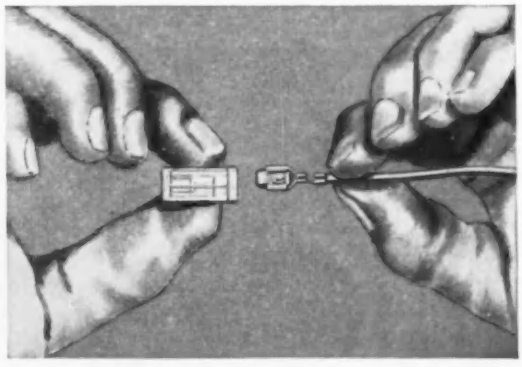
Make fast, easy wiring repairs on late model vehicles

- *Twenty-four items for wide service coverage*
- *All parts are identified*
- *Application data included*
- *Handy case has space for crimping pliers*

Packard Electric's 4004 Snap Fast connector kit contains original equipment parts used on over half of all the automotive vehicles produced today. The compact kit is sectionalized to keep parts separate and readily available without confusion. And it's built strong, for long wear.

The new Packard Electric connectors are all easily attached with terminal crimping pliers. They make quick, easy repairs and give you factory-type push-together connections that don't shake loose in service. Order a kit from your jobber today. It's another Packard exclusive, designed for your convenience.





Look how easy it is!

Instruction sheet identifies the proper part. Terminals go on quickly with crimping pliers.

Terminal then slides easily into insulator and connector is ready to snap on. Job finished!

with new . . .

Buy the line of wiring easiest to stock

and install . . . **Packard Electric**

Warren, Ohio

GM PARTS SALES

"Live Wire" division of General Motors

57-PA-8-C

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Continued from Page 12

the two exhaust systems and so more condensation and rust are bound to occur. It can be pointed out that a taxicab with a motor running continuously seldom rusts out a muffler.

As you may know, for every gallon of gasoline burned in an engine more than one gallon of water is produced and must pass out through the exhaust system. This water enters the muffler in the form of vapor. It passes all the way through as a gas if the entire exhaust system is hot enough. However, if there is a cold section in the exhaust system (below 212 deg), the vapor condenses on the cold sections of a muffler and forms water which rusts out the steel walls.

Lubrication Men Take Heed

LUBRICATION men, particularly those who use lifts whereby the complete front and rear suspensions hang free from the chassis when the vehicle is on the lift, should pay particular attention to the front and rear brake hoses. Should the suspension drop beyond the limit of the brake hoses, the hose may be permanently injured and require replacing. Also, care should be taken to insure that the lift does not kink either the brake or fuel line tubing along the frame. It has been brought to our attention that one fleet operator replaced a fuel pump twice in an attempt to get enough fuel to the carburetor for high speed operation. Further examination showed that the fuel line had been kinked (on the lift) to a point that it restricted the fuel flow, thus causing a loss of power at high speed.

Air-Conditioned Vehicle in Paint Ovens

WHEN A VEHICLE equipped with an air-conditioning unit is exposed to heat lamps or placed in a paint oven, the feed wire to the air-conditioning compressor clutch should be disconnected. After the vehicle is removed from the source of heat, the engine should be operated for a few minutes to permit the fan to stabilize the temperature of the condenser and refrigerant lines. The compressor clutch feed wire may then be connected and the air conditioning system operated. If this precaution is not adhered to, the high pressure from the extreme heat condition could damage the compressor seal and/or refrigerant lines when the engine is started.

(TURN TO PAGE 20, PLEASE)

"ACs Keep Oil Clean Longer! Cut Operating Costs!"

HAL J. LOVE
Vice-President and Assistant General Manager

JOHN TURNHAM
Shop Superintendent

"15,000,000 MILES A YEAR—AC OIL FILTERS ONLY!"

The 275 units of the Queen City Coach Company travel some of the roughest terrain east of the Mississippi, hauling passengers and express over all types of roads.

The records show—over a ten-year period—that AC Filters, changed regularly at 6,000 miles, "keep oil clean longer because of the large filtering area and even build-up of deposits over the entire surface of the element."

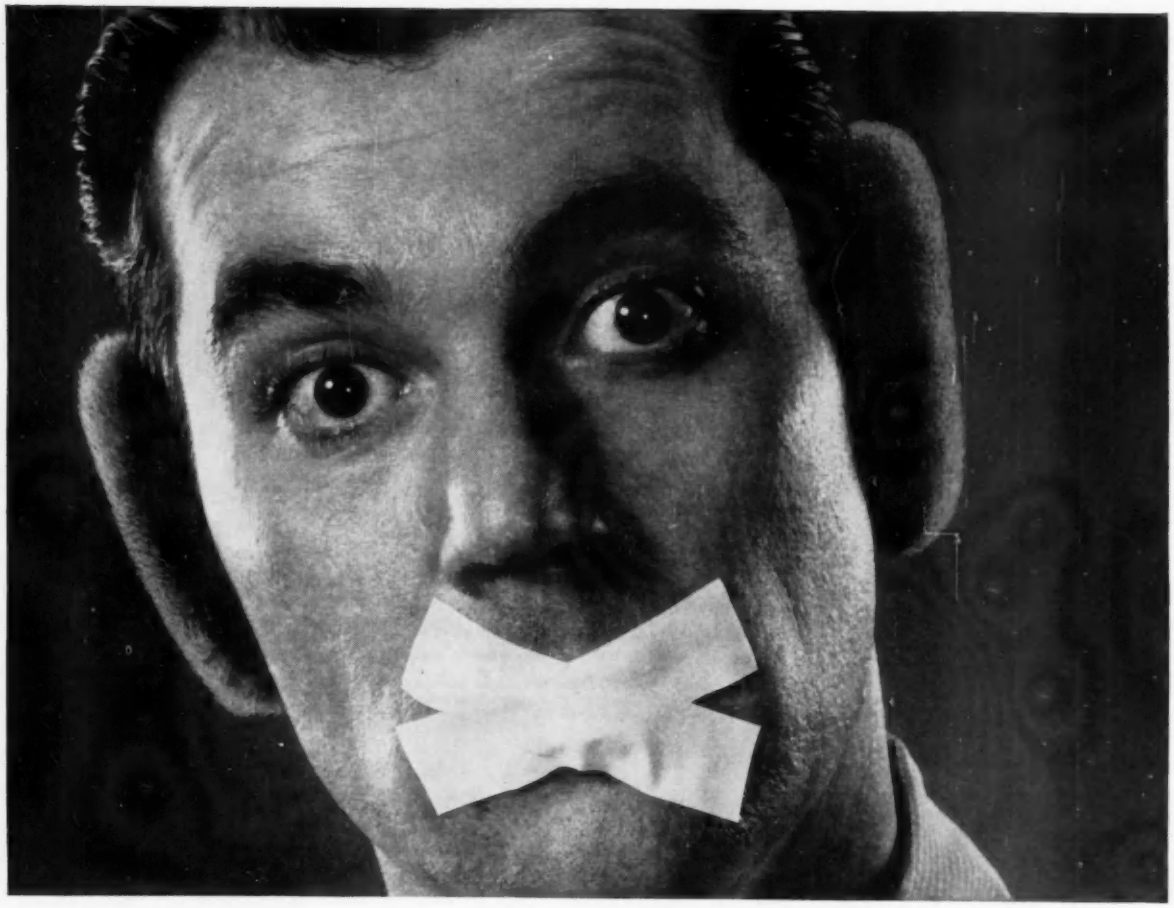
Q.C.C.C. management feels that "replacement with AC Filter elements definitely cuts operating costs."

Why not take a tip from Queen City and put AC Oil Filters to work in your fleet, too?

OIL FILTERS

GM GENERAL MOTORS

AC SPARK PLUG ⚛ THE ELECTRONICS DIVISION OF GENERAL MOTORS



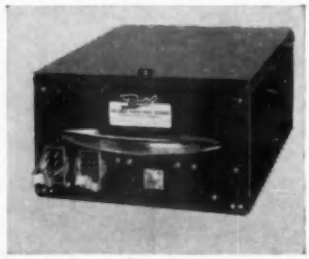
TAKE THE GAG OFF YOUR DISPATCHER— GIVE HIM BENDIX DYNA-COM 2-WAY RADIO!

There's only one reason all types of trucking operations are equipping with Bendix* Dyna-Com Two-Way Radio these days. It makes trucks more efficient and thus produces more profit.

What it does is virtually seat your dispatcher in the cab of every truck you operate. Since he can be in instant contact with every driver every minute, there's less back-tracking and deadheading. **The end result is 16% to 27% more tons hauled per truck, based on reports from Bendix Dyna-Com Two-Way Radio users.**

Customer service, of course, is improved beyond measure. If you will write us describing your particular type of operation, we'll have one of our specialists call on you with the complete story of Bendix Dyna-Com Two-Way Radio and what it will do for you. Address Bendix Radio Division, Mobile Radio Sales, Baltimore 4, Maryland.

*REG. U. S. PAT. OFF.



Bendix Dyna-Com Two-Way Radio covers all frequency ranges. Interchangeable between 6- and 12-volt vehicles without modification. Plug-in type Quiet-Line tone-coded units available.

Bendix Radio Division

Mobile Radio Sales • Baltimore 4, Maryland

Bendix AVIATION CORPORATION

"We've experienced new tire mileage with KRAFT® SYSTEM RECAPPING time after time!"

In Billings, Montana, Bill Fisher heads up Hi-Ball Contractors, a heavy-haul outfit that looks on Kraft Recapping as a partner.

Hauling tough loads over rough terrain, Hi-Ball Contractors credit KRAFT System Recapping for a very substantial decrease in overall tire costs.

Delivering profitable bonus mileage to haulers everywhere, the KRAFT System is respected for its business-like operation . . . for dependable service coast to coast.

To convince yourself of KRAFT's superiority in recapping, entrust your tires today to this quality system. Ask your nearest General Tire distributor for full details.

Kraft's Big Plus-4

- Extra long mileage, top-quality materials
- Factory-approved equipment
- Factory-trained recappers
- Guaranteed service Coast-to-Coast

KRAFT SYSTEM RECAPPING IS AUTHORIZED ONLY BY THE GENERAL TIRE & RUBBER COMPANY

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Continued from Page 16

Ford Oil Leak

ON SOME early production 1957 272-cu in. Ford truck engines oil leakage may occur between the crankcase ventilation cover and the cover gasket. This leakage can result from the use of the ventilation screen assembly which is too long and does not allow the cover to seat properly on the gasket. To eliminate this oil leakage, use metal cutting shears to trim the ventilation screen assembly to a length of 1 13/16 in.—Ford Service Dept.

Fan Belt Adjustment

FIELD REPORTS indicate early fan belt wear and failure is often due to improper belt tension adjustments. This is particularly true on multiple belt installations. Perhaps the best approach for the mechanic is to back off on all belt adjustments and start from scratch. Reset one unit at a time, such as generator, water pump, air compressor. It may be advisable to set up the unit and mark the setting, then back off the setting so as to be able to feel the adjustment on the following units. After all units have been set up individually, test the belt tension by rapidly accelerating from idle to governed speed. Belts should not slip or squeal under this test.

Floor Heat Deflector

IF COMPLAINTS are encountered on high floor pan temperature or unusually high temperatures within the vehicle during operation, the area of the floor plan immediately above the exhaust system should be checked to determine if the heat originates at that point. If so, it may be necessary to install a heat deflector above the exhaust system. Bear in mind that this deflector should have an air space between the deflector and the floor plate.

Voltage Regulators

THE VOLTAGE REGULATOR setting often must be "tailored" to adapt it to the battery and type of service. The ideal setting is that which will keep the battery at or near full charge with the minimum use of water. The

(TURN TO PAGE 24, PLEASE)

#3650 Chuck Gauge
This new chuck gauge is setting all-time performance records. Install several.

#7184 Blow Gun
A hundred uses for this handy Schrader gun.

Good fleet shop practice pays off with

#8159 Dual Foot Chuck
Service even the largest duals without skinning knuckles!

#3332 type Airline Filter
Use a Schrader airline filter—save money—protect your air tools.

#8052 type Couplers
Make any air outlet as convenient as your electrical service outlets.

GENUINE SCHRADER AIR SERVICE EQUIPMENT

Quick, handy Schrader Air Products speed and simplify many jobs your fleet requires. Use them for improving your shop practices, like this:

1. **Install extra airlines** at strategic shop points so air is always at your fingertips, saving steps and time.

2. **Make full use** of the complete line of Schrader Accessories — blowguns, chucks, chuck gauges, adapters . . . they're handy for service anywhere in your shop.

3. **Make certain tire pressures** are accurately kept and checked with genuine Schrader Gauges before vehicle goes out on the road. Seal air in with Schrader Caps and Cores. Insure against flats on the road that cost money—catch them in the shop.

Another money-saving Schrader Air Accessory is a Schrader airline filter—installed at each major pipe outlet it keeps out oil, rust, moisture—protects valuable air equipment.

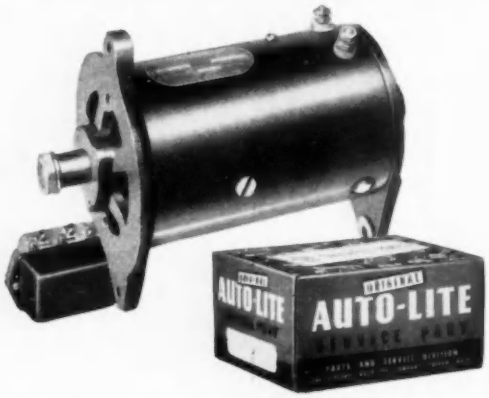
A. SCHRADER'S SON • BROOKLYN 38, N. Y.
Division of Scovill Mfg. Co., Inc.

Improve your shop practices with Genuine Schrader Products—order from your supplier.

Schrader®
a division of **SCOVILL**

FIRST NAME IN TIRE VALVES
FOR ORIGINAL EQUIPMENT AND REPLACEMENT

Less Down Time, Lower Maintenance Costs When You...



AUTO-LITE SPECIAL DUTY GENERATORS with matching voltage regulators are designed specifically for vehicles that need high generator output at all speeds. Low cut-in and high output at low RPM prevent down time from discharged batteries caused by low-speed and stop-and-go operation. Gives completely safe operation at high speeds, too. Available for most 6- and 12-volt applications.

AUTO-LITE STA-FUL BATTERIES are proved by a two-million-mile test to be the finest batteries money can buy. The Sta-ful *extra liquid reserve* offers additional protection for rugged fleet operations. Available dry-charged or wet, Auto-Lite Sta-ful *needs water only ⅓ as often*. Heavy case construction and fibre-glass separators assure long life in the most severe service. A full line in either 6 or 12 volts.

INCREASE PAYLOAD PROFITS WITH . . .

AUTO-LITE®

SPARK PLUGS
BATTERIES
WIRE AND CABLE
ORIGINAL SERVICE PARTS

THE ELECTRIC AUTO-LITE COMPANY, TOLEDO 1, OHIO

Standardize on Auto-Lite!

Ignition-engineered AUTO-LITE electrical equipment keeps your fleet operating at full profit

Your fleet's service performance, and your profits, depend on the reliable operation of your vehicles' starting and ignition systems. For that reason you can't afford to take chances with anything but the best when new parts are needed. Ignition-engineered Auto-Lite electrical equipment assures top performance and long service life in the toughest fleet operation.

AUTO-LITE SPARK PLUGS are ignition-engineered to give top performance in all types of vehicles. The complete line includes the Auto-Lite Transport Spark Plug with heavier insulator and over-sized electrodes for extra-heavy service . . . and the Auto-Lite Resistor Spark Plug with Power Tip that gives overhead-valve passenger car engines top performance and economy at all speeds.

AUTO-LITE WIRE AND CABLE is available for all cars and trucks. Auto-Lite "Neosheath" Spark Plug Wire has Neoprene insulation that resists heat, oil, ozone, and other harmful agents. Plastic and "Flextrand" Primary Wire is available for every need. "Power Line" Cables have exclusive "Power Line" terminals with steel inner core that holds shape—keeps full contact for full power.

Send now for full information on the new AUTO-LITE NATIONAL FLEET ACCOUNTS PROGRAM that can mean substantial savings for you in electrical maintenance costs.

Manager, Fleet Sales CCJ
THE ELECTRIC AUTO-LITE COMPANY
Toledo 1, Ohio

Please send full information about the new Auto-Lite National Fleet Accounts Program.

NAME_____

COMPANY_____

POSITION_____

ADDRESS_____

CITY & STATE_____

CCJ AT YOUR SERVICE

Continued from Page 20

"normal" setting usually will be satisfactory for average service. However, if service is above or below average, the setting must be tailored to fit the job. Either of two conditions which may exist will require tailoring; (1) battery is being overcharged (using too much water), or (2) battery remains undercharged (¾ charge or less). Corrections may be made as follows:

1. If battery uses too much water at normal setting, reduce voltage setting 0.1 or 0.2 of a volt and check for improved condition over a reasonable service period. Repeat until battery remains charged with a minimum use of water. It rarely will be necessary to go below 13.8 volts on a 12-volt system or 6.9 volts on a 6-volt system. CAUTION: Whenever the voltage setting is reduced, the cutout relay must also be checked and reduced if necessary. It must be at least 0.5 of a volt less than voltage regulator setting.

2. If battery is consistently undercharged at normal setting, increase the voltage setting 0.1 of a volt and check for improved condition over a reasonable service period. Repeat until the battery remains charged with a minimum use of water. It rarely will be necessary to increase the voltage above 14.8 on a 12-volt system or 7.5 volts on a 6-volt system. CAUTION: When increasing voltage avoid settings high enough to damage lights or other voltage-sensitive equipment during cold weather operation. Before tailoring the voltage setting for unusual conditions be sure the battery is normal—not sulfated, not permanently damaged due to having been overheated not operating in too hot a location and not poorly ventilated (Courtesy—Delco-Remy Service Bulletin).

Ceramic Clutch Facings

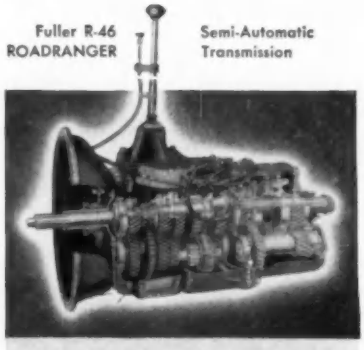
SPEAKING BEFORE the Motor Vehicle Fleet Supervisors Training Conference at the University of California, Mr. Clark, sales engineer for the Clutch Division, Lipe-Rollway Corp. Syracuse, N. Y., stated that ceramic compounds, originally developed for extreme temperature conditions in airplane brakes, are now being used for heavy duty clutches on tractors, trucks, buses, heavy earth-moving machinery, and for industrial disc-type clutches and brakes.

According to Mr. Clark, ceramic facing is

(TURN TO PAGE 28, PLEASE)

One of Yule's new C.O.E. International Tractors with Fuller 8-speed ROADRANGER Transmission

YULE eliminates transmission problems with FULLER 8-speed ROADRANGERS®



FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich. Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest. Dist. Office, Tulsa 3, Okla.

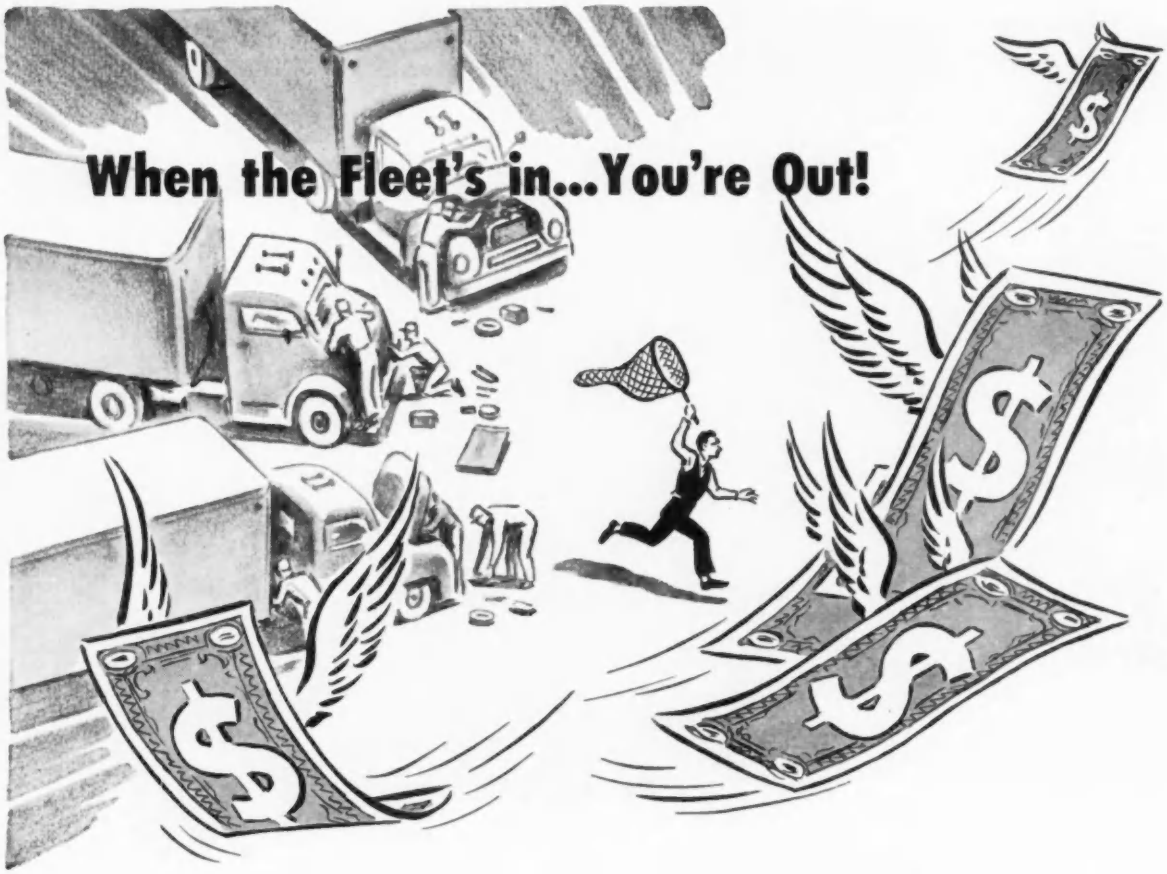
Says V. A. Martell, President of Yule Truck Lines, Inc., Milwaukee, Wisconsin: "Fuller ROADRANGERS have eliminated all our transmission problems. We get the kind of gearing we need to take us through any kind of traffic and road condition. After continuous testing under every conceivable condition, the Fuller 8-speed semi-automatic ROADRANGER Transmission thoroughly proved itself. Our drivers say: 'This is it!' and they wouldn't have anything else."

"And," adds E. A. Jenkins, General Manager—Operations: "We will have ROADRANGERS in our future units for sure. For our operation, ROADRANGER Transmissions, C.O.E. tractors and big engines are the answer. Our maintenance superintendent credits the Fuller ROADRANGER Transmission with increased efficiency and with decreased maintenance cost."

Yule's latest fleet additions include 10 International CO-205 Tractors with RD-450 Engines, and 5 International R-195 Tractors with RD-406 Engines . . . all equipped with Fuller 8-speed semi-automatic ROADRANGER Transmissions.

The same outstanding ROADRANGER Transmission advantages . . . low maintenance costs—easier, quicker shifts—higher average road speeds—greater fuel economy—38% steps between ratios keep engines operating in the high rpm range—less driver fatigue—space-and-weight saving economies . . . can be applied to *your* operation.

For complete details on Fuller ROADRANGERS, see your truck manufacturer or truck dealer now!



Quick Clutch Replacement with Lipe Factory Exchange Units

Reduces Repair Bills up to 25%

When clutches go and trucks don't — it's costing you money. Not only money lost because trucks aren't on the road, but money for labor and tools to repair them.

Just four words will solve these problems and slash repair bills as much as 25%: LIPE FACTORY EXCHANGE UNITS. Every Lipe Factory Exchange Unit is built of the same quality materials — to the same precise tolerances — tested to the same exacting specifications — as a new clutch. As such it carries Lipe's Seal of Protection — your guarantee of *Genuine* Lipe Parts and craftsmanship.

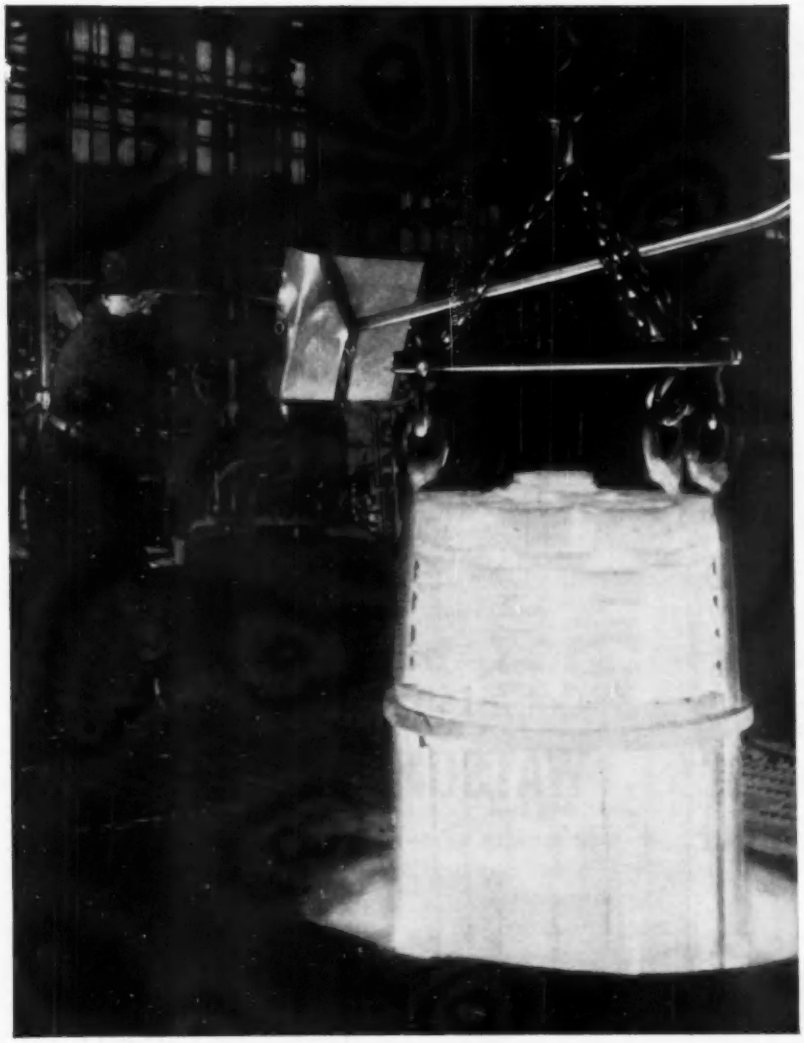
Simply replace the old clutch with a new Lipe Factory Exchange Unit and your truck is ready to roll. Think of the savings this means in overhead alone. Next time you need a clutch repair job, have a stock of Lipe Factory Exchange Units on hand to speed up repairs and save you money. An authorized Lipe distributor is nearby — ready to serve you.

Manufacturers of Automotive Clutches & Machine Tools

LIPE ROLLWAY

Lipe-ROLLWAY CORPORATION SYRACUSE 1, N. Y.

We make 'em hard on the outside, tough on the inside



(Another reason why TIMKEN® bearings are first choice with truck manufacturers)

WE case-harden every Timken® bearing race and roller in the world's largest battery of case-carburizing furnaces. It makes them hard on the outside to resist wear, tough on the inside to take shock. You get longer bearing life with trouble-free operation.

Timken bearings are designed according to geometric law to roll true. They're made to live up to that design—every step of the way—through rigid quality control. We even make our own steel—America's only bearing manufacturer that does. That's why Timken bearings are first choice with the men who know trucks best—the manufacturers.

Do what they do. Always specify Timken bearings. They're *your* best bet for replacement. And for your free copy of "Timken Tapered Roller Bearings—Their Care and Maintenance", write Dept. JCC-7, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

SINCE THEY'RE BEST WHEN THE TRUCK IS NEW, THEY'RE BEST FOR REPLACEMENT, TOO!

TIMKEN TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD

CCJ AT YOUR SERVICE

Continued from Page 24

riveted on the clutch disc assembly with a special hydraulic press. The disc facings are then ground to control over-all thickness and parallelism of the completed assembly.

Coefficient of friction ratings as low as .20 are possible, as compared to .25 for organic materials. This ceramic material and metallic ingredients possesses excellent heat conductivity which permits more efficient heat dissipation. Ceramic facings in the form of buttons also increase the circulation of air which provides more rapid heat dissipation.

Finding Exhaust Leaks

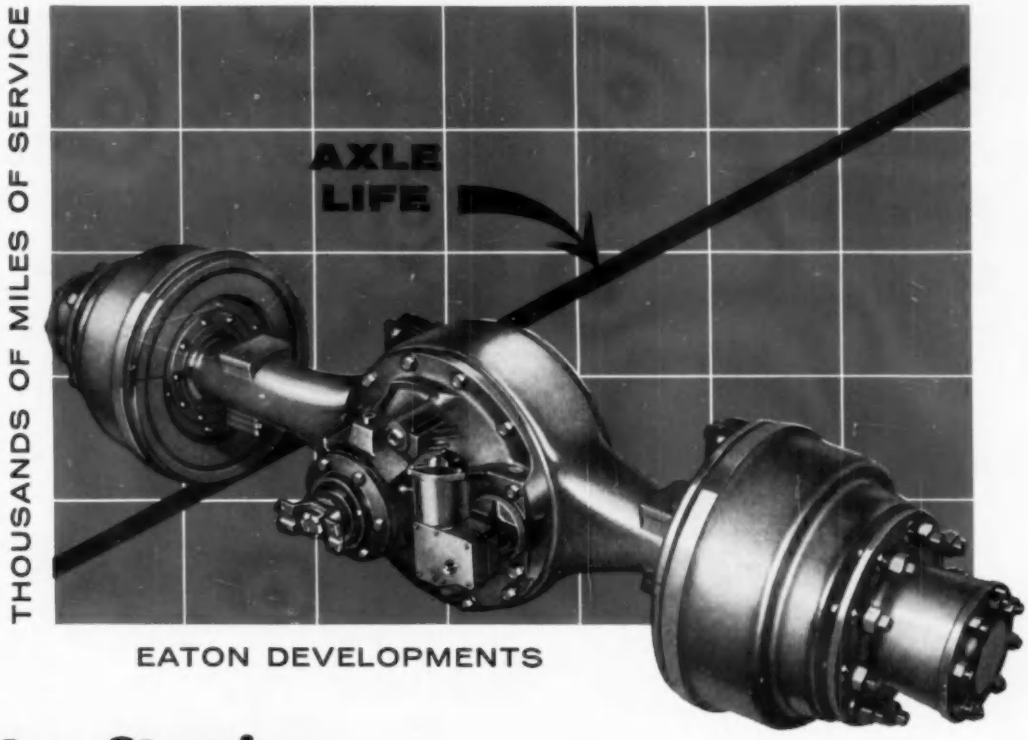
SOMETIMES IT is virtually impossible to find small exhaust leaks around the engine, due to normal engine noise interfering with the sound of a leaking exhaust. Here is a way that has been helpful in the past. Drive the vehicle out of the shop and remove the air cleaner. With engine running, squirt engine oil into the carburetor with a pressure type oil can. The burning oil will cause an excessive amount of visible smoke to come out at the exhaust leak.

Gold-Plated Windshields

FORD RESEARCH engineers are now conducting an experiment that puts a gold coating on glass plate, 30,000 times thinner than a human hair. This coating allows cooler light rays to pass through the glass while screening out heat rays. Ford engineers say that the coating process is stopped when the deposit of gold atoms is one-thousand times thinner than a machinist's micrometer can measure. Also light insulating experiments are being made with silver, aluminum, zinc, copper, vanadium, tantalum, titanium and uranium as well as minerals having unusual optical properties.

Extra Cooling Requirements

SHOULD additional engine cooling be required in warmer areas at sustained low speeds or when operating under extreme load conditions, the following should be considered. Four-bladed fan should be replaced with five-bladed fan, or six-bladed fan. Most manufacturers can supply extra-bladed fans for just this purpose. This will prevent engine damage due to overheating.

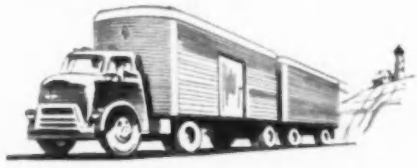


Extra Stamina

Makes EATON 2-Speed Axles BEST for Modern High-Powered Trucks

Through continuous advancement in design and metallurgy, Eaton 2-Speed Axles provide the greater stamina needed to meet the demands of modern motor truck transportation. They supply the perfect combination of ruggedness and light weight, which means that Eaton Axle trucks haul maximum payloads, at lowest cost per ton—and lowest cost per mile.

By furnishing the right gear ratio for every operating condition, Eaton 2-Speeds reduce stress and wear on engines and all power transmitting parts; they keep trucks on the job, out of the repair shop. Operating and maintenance costs are held down to rock bottom; trucks last thousands of miles longer, and are worth more when traded-in.

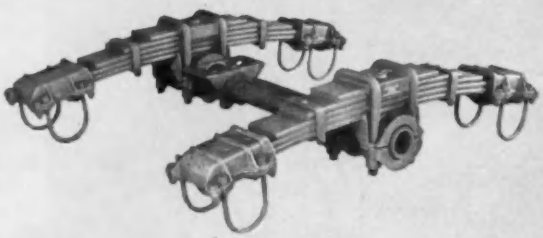


More than Two Million Eaton Axles in Trucks Today. For complete information, see your truck dealer.

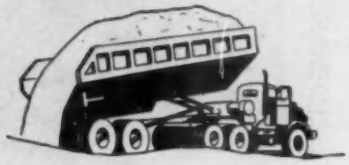
EATON — *AXLE DIVISION*
MANUFACTURING COMPANY
CLEVELAND, OHIO

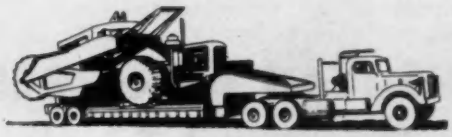
PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioning Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

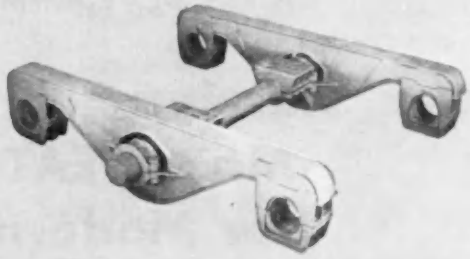
NEWAY . . . Trailer Suspensions



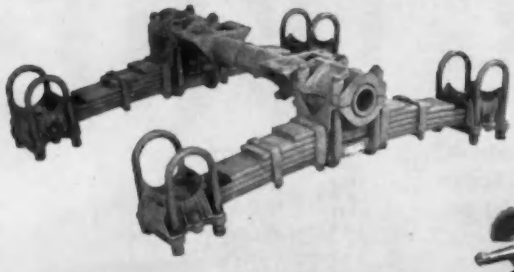
TWO SPRING TANDEM



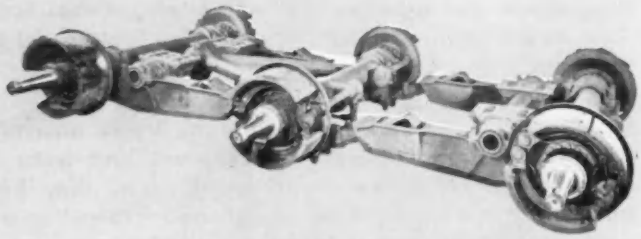




WALKING BEAM TANDEM



TWO SPRING LOWBED TANDEM



THREE AXLE SUSPENSION

NEWAY will engineer and build any of the above models to fit your particular needs — such as change in spring centers — special axle spacing — outboard mounting — longer trunnion shaft length—special axle shapes and sizes and capacity.

no LUBRICATION AT ANY TIME.

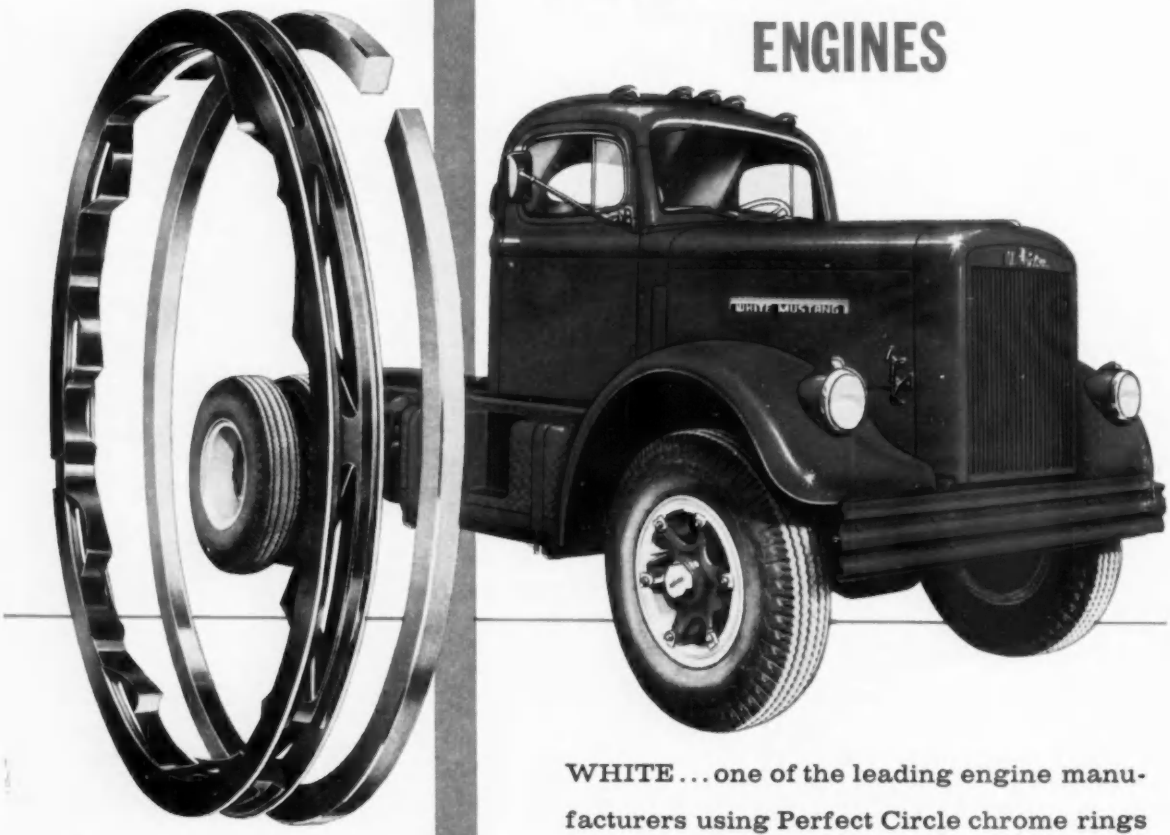
THE ORIGINAL RUBBER MOUNTED SUSPENSIONS

For

Best Performance in

White

ENGINES



WHITE... one of the leading engine manufacturers using Perfect Circle chrome rings for both original equipment and service requirements

PERFECT CIRCLE

2-in-1 CHROME PISTON RINGS... *the standard of comparison*

UP FRONT WITH CCJ

JULY 1957 FLEET HIGHLIGHTS AS REPORTED BY COMMERCIAL CAR JOURNAL

MR. EXECUTIVE, Air suspensions are coming for passenger cars, may offer advantages for light trucks. For example: Lower floor height could mean more cubic space in body. Also, there'll be less jounce and bounce for both truck and cargo under partial load. (This last feature has led Fruehauf to test auto haulaway trailers with air springs. On standard springs, these trailers tend to undergo heavy punishment on empty return trips.) U. S. Rubber now makes air springs for the Cadillac "Eldorado Brougham," and both Firestone and General Tire and Rubber are tooling-up to produce units to be offered as optional equipment on some 1958 passenger car models. Firestone claims its "Airide" springs used in performance tests operated for 600,000 to 700,000 miles on trucks and buses "without showing evidence of wear or weakening."

SAFETY CHECK conducted on a nationwide basis by the Interstate Commerce Commission early in May resulted in 1153 vehicles being declared "out of service." This was 10.3 per cent of the 11,140 vehicles inspected. As in the three nationwide road checks held last year, nine out of 10 vehicles had one or more defects or deficiencies in respect to the ICC's safety regulations. Fifth nationwide check is being held this month, will include buses. Warning: If too many of your vehicles are being written-up, you might as well get ready for a complete ICC safety survey of your fleet.

BRAKE STUDIES by the ICC in cooperation with the Bureau of Public Roads were given the green light at the first meeting of the project's Advisory Committee (June, page 33). Brake testing will be in three phases. As earlier announced, the first will be of laboratory type. Its aims will be to (1) find what delays are inherent between the moment the driver's foot hits the brake pedal and the time braking force is developed, and (2) test the compatability of various brake system components with one another. Second phase will include actual vehicle stopping tests with various types of emergency brake equipment. Also to be considered are such items as brake fade, jack-knifing and wheel dance. Last part of the tests will look into the reliability and maintenance of various braking systems and components.

HIGHWAY BUILDING is the "cover" story in **Time** magazine's June 24 issue. While it won't help you in the operation and maintenance of your highway building fleet, it should be shown your friends and neighbors so as to keep-up public support and enthusiasm to insure the 16-year life of today's gigantic highway building plans. That these highways are necessary is emphasized in the June 18 issue of the **Wall Street Journal.** It cites the growing trend to ship food over long distances by truck. Reasons given for the shift away from rail use include (1) trucks are faster and more flexible, (2) better highways, (3) improvements in truck refrigeration, (4) lower rates and greater freedom from regulation.

DETROIT DISPATCH

FUEL INJECTION HOLDS more promise for heavy duty vehicles than for passenger cars. This is the view of one expert now testing a system of his own make in cars and trucks. Fuel economy is expected to offset higher initial costs. (For a look at fuel injection's advantages in detail, see page 66 this issue. Also, on page 104 is a concise report of how GM's system works.)

WHITE HAS bought Reo, the fourth company to be acquired by White since 1951. It also marks the third change in management for Reo in three years. In addition to the Reo line of trucks, White gets an added source of engines including the new V-8 Reo brought out three years ago. John C. Tooker, former Reo president, stays on as general manager of the Reo division. Recurrence of the rumors that White was also making a deal for Diamond T has again brought denials from both companies.

GOVERNORS DRIVEN by the transmission are being given attention. Reason is, say truck makers, a trend to large, high speed engines. Although such engines are intended for part throttle operation, there are occasions when full throttle is needed to maintain schedules. Consequently, with such engines, it is desirable to limit top road speed without choking needed engine performance.

GM STOPPED TO count-up the optional items it offers truck users, came-up with the interesting note that it could—by varying option selection—build more than 1½ million trucks without duplication.

TEXTILE WORLD, a leading textile magazine, says tire life on passenger cars are being driven 75 mph on turnpikes is about 12,000 miles. This relatively short life is causing a build-up of pressure for tire improvement, the magazine notes.

NEXT NATIONAL AUTO SHOW WILL probably be held some time late in the fall of 1958. Preliminary plans to hold a New York City showing of 1958 models next January have been cancelled. One big obstacle was the unavailability of the New York Coliseum on dates that did not conflict with other shows and exhibits.

SPEED WILL NOT be emphasized in passenger car advertising if car makers follow the recommendation of the Board of Directors of the Automobile Manufacturers Assn. It also recommended that makers not participate in public stock car or other racing.

MORE V-8's ARE being ordered than 6-cyl engines, says Dodge. They now account for 54 per cent of total Dodge truck production compared with 48

WASHINGTON WATCH

RAID ON the Highway Trust Fund by the Labor Dept. has been stopped by the Senate (May, page 33). The Department will get some money to cover costs of wage determination in connection with federal highway aid but not from earmarked highway use tax revenue if the Senate has its way.

HIGHWAY BUILDING IS growing. Senate is debating a proposal to add 7000 miles (to the 41,000 presently authorized) and seven years (to the 13 planned) to the Interstate Highway program. It brings the total estimated cost to at least $44 billion—probably as high as $50 billion—for this highway system alone.

HOWEVER, chances are the proposal won't receive any serious consideration until next year. Even then two more pressing problems need solving. Higher than estimated costs leave no doubt that more funds will have to be authorized to finish the 41,000 miles planned. Second question is who pays the added bill?

TEMPORARY OPERATING PERMITS MAY be extended beyond 180 days by the Interstate Commerce Commission. The authority was confirmed last month by the Supreme Court despite railroad opposition.

NEW RULES HAVE been prescribed by the ICC covering (1) route deviations by authorized carriers—MC-C 2078, and (2) transport of migrant workers by motor vehicle—MC-40. The Commission also postponed until Sept. 1 the effec-

per cent in 1956. Ford notes that only 25 per cent of medium duty truck orders specify sixes. However, at present 52 per cent of Ford's 1957 model pick-ups carry 6-cyl engines as compared to 42 per cent for the 1956 model.

TRAILERS GOT attention at ATA's Regular Common Carrier Conference meeting in San Francisco. RCC's Equipment Committee asked trailer makers to (1) mark carrying capacity of floor and (2) standardize dimensions of removable-type king pins. The Conference's Operations Committee asked that all trailers be wired in accordance with ATA wiring code E-3-1957.

INTERNATIONAL HAS announced four new truck axles. For 190 Series 6-wheel trucks, there's a light weight, tandem rear axle rated at 34,000 lb. It is 179 lb lighter than the standard model. For concrete mix trucks and similar applications, there's a 15,000-lb capacity front axle. Two new heavy duty rear axles complete the grouping. Rated at 18,500 and 21,500 lb, they are compatible with 8- and 10-speed transmissions. Ratio spread is 5.375, 6.142, 6.571 and 7.166 to 1.

WILLYS'S NEW FC-150 5000-lb GVW truck is now available with a dump body or a utility service body in addition to the earlier announced platform stake and pick-up bodies.

tive date of its rules governing household goods transportation—MC-19.

EXCISE TAX ON a rubber tire is based on the type and not the intended use of the tire. Says the Internal Revenue Service (in Revenue Ruling 57-218), a highway-type tire is subject to the 8¢ per lb tax even if bought for use on an off-highway truck.

ATA FOUNDATION HAS received a check for $50,000 marking Goodyear Tire and Rubber Co.'s renewed participation in the Foundation's program.

MOVERS' CONFERENCE of America, the ATA affiliated household goods carrier group, has appointed William J. Burns as its general manager.

TRUCK TONNAGE

Month	% Change from Previous Month	% Change from a Year Ago
1st Quarter, '57	....	+ 0.7
March, 1957	+ 7.5	- 1.8
February, 1957	- 7.0	- 2.4
January, 1957	+14.4	+ 3.7
4th Quarter '56	....	- 0.2
December, 1956	-12.2	- 5.6
November, 1956	-10.2	- 1.4
October, 1956	+15.7	+ 7.9
3rd Quarter '56	....	+ 0.4
September, 1956	- 6.5	- 6.6
August, 1956	+12.7	+ 1.3
July, 1956	....	+11.2
2nd Quarter '56	....	+ 5.6
June, 1956	- 0.9	+ 5.8
May, 1956	+ 5.5	+ 6.4
April, 1956	- 5.2	+ 0.9

FIRST QUARTER truck freight was 0.7 per cent higher than first quarter, 1956, reports ATA's Research Dept. This put the first quarter truck tonnage index at 189, a point higher than the earlier record of 188 in first quarter, 1956. It marks the third consecutive year in which a gain has been registered in the first quarter. Around the country, seven out of the nine regions showed increases. By commodities, seven out of the 10 groups showed gains as compared to the same three-month period in 1956. (Regional and commodity data is given in detail on page 110, this issue.) By type of carriage, common carriers were up 1.7 per cent, and contract fleets down 6.1.

TRUCK AND BUS PRODUCTION

Makes	For Weeks Ending June 8	June 1	May 25	Year to Date 1957	1956
Chevrolet	7,270	6,241	6,890	165,109	176,824
G. M. C.	1,135	711	1,366	31,470	46,580
Diamond T	122	95	121	2,163	2,243
Divco	64	48	80	1,685	1,945
Dodge and Fargo	1,399	993	1,510	37,646	40,608
Ford	7,644	5,526	7,877	163,605	143,150
F. W. D.	25	16	23	502	918
International	3,093	2,359	2,956	49,752	66,251
Mack	328	225	329	7,787	8,471
Reo	104	78	131	1,629	1,698
Studebaker	191	147	162	5,341	7,112
White	280	199	332	7,388	8,707
Willys	1,556	973	1,515	28,598	27,052
Other Trucks	95	84	85	1,990	2,953
Total—Trucks	23,306	17,395	23,377	504,645	534,512
Buses	100	64	104	993	1,989
Total—Trucks and Buses	23,406	17,459	23,481	3,006,272	536,501

Source: Automobile Manufacturers Assn.

IN THIS ISSUE

ENGINES get emphasis. NTTC Meeting Asks, What **POWER** for your trucks? (Page 66). B&W **BUS** tells how **OIL ANALYSIS** guides service (page 70). Delco-Remy's Hartzell discusses choice of **ELECTRICAL COMPONENTS** (page 72). SAE Summer Meeting considers economics and **DIESEL** engines (page 78). A special report highlights **INSTRUMENTS** as modern key to engine efficiency (page 85).

You'll get some ideas from a description of Gillicz Construction Co.'s base shop **MAINTENANCE** methods (page 82).

There are two special "let's see how it works" reports. One is on International's Select-O-Matic **TRANSMISSION** (page 100), the other on GM's **FUEL INJECTION** (page 104).

The Road Ahead

MORE FREIGHT FOR eastern motor carriers is likely to result from last month's 15 per cent (11 per cent plus last December's 4 per cent) increase in Railway Express rates on less-than-carload shipments. Railway Express estimates about 12½ per cent of its freight volume will probably shift to other types of carriers. Interstate Commerce Commission says this figure "is conservative."

PIGGY-BACK VOLUME IS still increasing. Latest figures from American Assn. of Railroads show weekly average so far this year to be about 4700 rail carloads as compared to the 1956 weekly average of 4000. The report did not include information on the number of semi-trailers moving in the service.

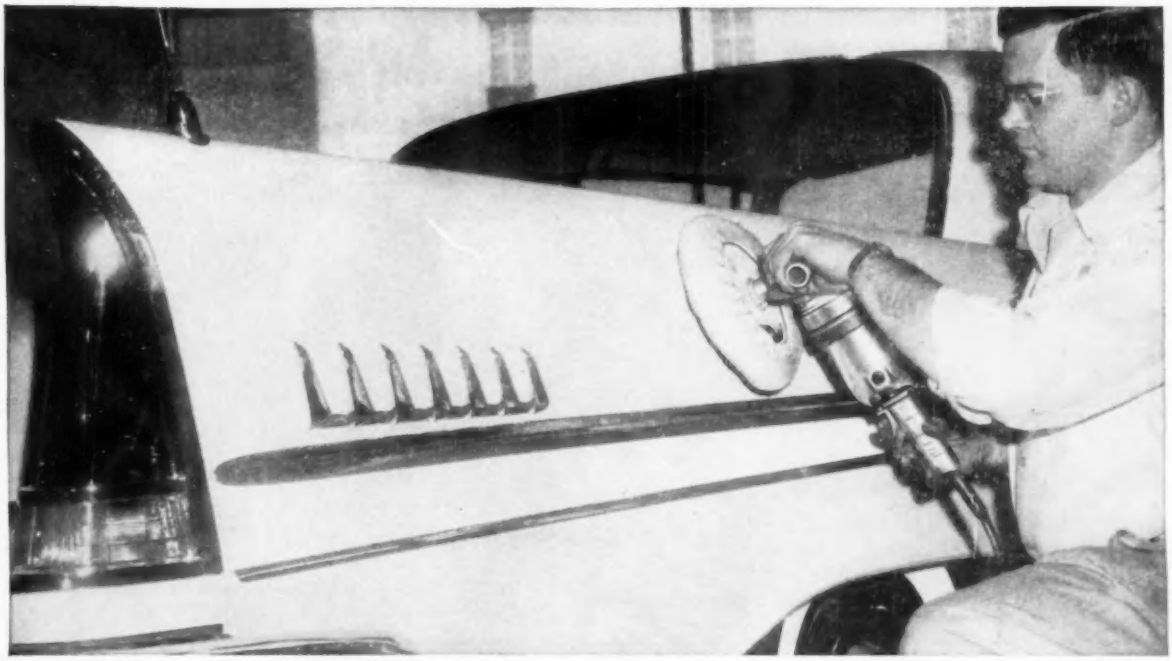
AASHO ROAD TEST TRAFFIC HAS been postponed until September, 1958. Reason is that only one bid was received for paving of test highway and that was about $2½ million higher than planned. Effort will be made to change the specifications to bring down the cost without affecting the validity of the research program.

PUBLIC RELATIONS WILL occupy the attention of Truck-Trailer Manufacturers Assn. at their Summer Meeting being held middle of this month. Goal is to find methods to improve "public acceptance of truck-trailers." Among the experts contributing ideas are American Trucking Assn. Public Relations Director Walter Belson, Sutherland Paper Co. PR Director Rex Paxton (for the private carriers), Les Allman of L. C. Allman Co., Markel Service Vice President "Uncle Charlie" Ray, Great Southern Trucking's Leigh Culley (for the common carriers) and Trailmobile PR Manager Dick Abels. They'll also lead a public relations "brainstorming" session.

SAFETY CERTIFICATION COMMITTEE MEETS next in September. Applications for certification as Safety Director, Safety Supervisor or Driver Trainer can be obtained from Institute for Public Safety, Pennsylvania State University, University Park, Pa. They must be returned by Sept. 1. Note: The National Committee for Motor Fleet Supervisor Training has revised the certification standards.

APRIL PRODUCTION TOTALS SHOWN below confirm earlier reports that April '57 was ahead of April '56 in several items.

In thousands of units, except bus sales are in actual numbers	New Truck Registrations		Truck Factory Sales—Domestic		Truck Trailer Shipments		Bus Factory Sales—Domestic		Truck and Bus Tires				
									Replacement Shipments		Original Equip. Shipments		Inventory End of April
	April	4 Months	April	4 Months	April	4 Months	April	4 Months	April	4 Months	April	4 Months	
1957	75.4	269.2	84.4	304.8	5.5	21.1	410	1208	770.5	2748.4	437.6	1415.4	3486.2
1956	82.7	291.5	82.4	336.9	6.4	22.6	380	1281	766.9	2823.2	430.2	1736.9	3483.0



THOR POLISHERS

Higher speed for higher output • 2000 r.p.m.

Get a new Thor EL-91 high speed polisher on the job and watch the output of polish jobs climb. Where standard polishes are used, this tool is guaranteed to produce more and better polish jobs per shift. For safe application at high speed, Thor recommends use of a pneumatic backing pad with the Model EL-91 polisher. For applying certain of the commercial car conditioning materials, use the polisher most car manufacturers approve and use in service clinics—the Thor EL-92 power plant that maintains efficient speed under load.

THOR SANDERS

50% more power to surface

Thor sanders deliver this big plus of power right to the surface and maintain it under load. You remove metal more efficiently, faster and at lower cost. Thor adds the extras—like a rubber bumper guard to protect finishes and a spindle lock for fast disc change—at no extra cost. Thor sanders are offered in 7" standard duty and 7" and 9" heavy duty sizes. Ask your Thor automotive jobber for a demonstration. Thor Power Tool Company, Prudential Plaza, Chicago 1, Illinois.

THOR POWER TOOL COMPANY • CHICAGO • BRANCHES IN ALL PRINCIPAL CITIES

"We move '10 frame ho

See "THE GOODYEAR PLAYHOUSE"—TV—Sunday 9-10 E. D. T.

Buy and Specify GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY

OTHER

houses' in half the time *with Triple-Tough 3-T Cord Tires!"*

Hammond-California doubles log take-out with same cord that saves millions for highway haulers!

"One redwood can top 200 feet—can be 12 feet across the base—and contain lumber enough for 10 frame houses!

"But to *profit*, we've got to get it out in massive 30- to 50-foot *logs*, smoothly and *quickly*.

"Our problems begin," continues Hammond's Logging Superintendent Gray Evans, "when 20 stories of tree is lying across some ridged and gullied hillside, like our Elk River and Big Lagoon shows.

"We used to worry 'em out with steel-wheeled *arches*—mobile booms that dangle one end of the logs while bulldozers drag them to the trucks. But steel wheels are slow, awkward, bog down and cut ground cables.

"We'd have loved to go to rubber tires—but in such rough country, arches *tip* and full weight is thrown on *one wheel!* Tires just couldn't take it.

"Or so we thought—until we tried Triple-Tough 3-T Nylon Cord Goodyears.

"They took it! They did steel's job—and did it faster and better! They also did things steel *couldn't* do—and without new sets of drawbacks!

"Under these tough conditions of ours, in all our 7 operations, *we haven't had a single failure—or headache—due to 3-T Nylon Cord!*

"What's more, ONE arch takes out 200,000 board feet a day—where it formerly took TWO steel-wheeled arches to handle 220,000!

"Are we using Triple-Tough 3-T Nylon Cord tires on our trucks, too? You bet we are—and our truck tire costs-per-mile are consistently hitting new LOWS!"

Hammond-California Redwood Company is part of one of the world's most successful lumbering operations. Following their lead could bring more profits to you—whether your haul is *on* the highway or *off*. Contact any Goodyear dealer—or Goodyear, Truck Tire Dept., Akron 16, Ohio.

LICKS THE 3 GREAT TIRE-KILLERS ON HIGHWAY HAULS OR OFF!

Unless a tire's cord body defeats the HEAT of long runs—the SHOCK of murderous bumps—the FATIGUE of hard service—all the rubber in the world can't save it! TRIPLE-TOUGH 3-T Cord is *triple-tempered* by Goodyear's exclusive "Tension, Temperature and Time" process *expressly to lick those 3 great tire-killers*—and so deliver most mileage, most recaps.

GOODYEAR TIRES

Look for this nearby Goodyear dealer sign for better tire values—better tire care.

Tubeless or Tube-Type

R

OTHER KIND

DATES and DOINGS

JULY

15-17—Truck Trailer Manufacturers Assn., Summer Meeting, Homestead Hotel, Hot Springs, Va.
18-19—State Truck Association Managers, Annual Conference, King's Gateway Lodge, Lond O'Lakes, Wis.

AUGUST

11-14—Movers Conference of America, American Trucking Assns., Annual Assembly, Jefferson Hotel, St. Louis, Mo.
12-15—Society of Automotive Engineers, West Coast Meeting, Olympic Hotel, Seattle, Wash.
14—Interstate Freight Carriers Conference, Board of Directors Meeting, Los Angeles, Cal.
19-20—North Dakota Motor Carriers Assn., Annual Meeting, Hotel Clarence-Parket, Minot, N. D.
20-22—Industrial Relations Dept., American Trucking Assns., Annual Forum on Trucking Industrial Relations, Hotel Statler, Detroit, Mich.
31-Sept. 2—Mississippi Transport Assn., Annual Meeting, Hotel Buena Vista, Biloxi, Miss.

SEPTEMBER

11-13—Michigan Trucking Assn., Annual Meeting, Hotel Sheraton-Cadillac, Detroit, Mich.
11-17—Interstate Freight Carriers Conference, Board of Directors Annual Membership Meeting, Los Angeles, Cal.
12—Motor Truck Assn. of Connecticut, Annual Convention, Hotel Statler, Hartford, Conn.
12-14—Indiana Motor Truck Assn., Annual Meeting, French Lick Springs Hotel, French Lick, Ind.
17-18—Central Motor Freight Assn., Annual Convention, Conrad Hilton Hotel, Chicago, Ill.
18-20—National Assn. of Motorbus Operators, Annual Convention, Drake Hotel, Chicago, Ill.
19-20—Tennessee Motor Transport Assn., Annual Meeting, Andrew Johnson Hotel, Knoxville, Tenn.
19-21—Idaho Motor Transport Assn., Annual Convention, Sun Valley Lodge, Sun Valley, Idaho.
19-21—Pennsylvania Motor Truck Assn., Fall Meeting, Bedford Springs Hotel, Bedford, Pa.
20—Minnesota Motor Transport Assn., Annual Meeting, Hotel St. Paul, St. Paul, Minn.
20-22—Virginia Highway Users Assn., Annual Meeting, The Cavalier Hotel, Virginia Beach, Va.
22-26—American Transit Assn., Annual Metting, Sheraton-Mt. Royal Hotel, Montreal, Quebec, Canada.
26-27—Kansas Motor Carriers Assn., Annual Convention, Hotel Broadview, Wichita, Kan.
27—Iowa Motor Truck Assn., Annual Meeting, Savery Hotel, Des Moines, Iowa

OCTOBER

29-Oct. 3—North Carolina Motor Carriers Assn., Annual Convention, Hotel Carolina, Pinehurst, N. C.
2-8—Regular Common Carrier Conference, American Trucking Assns., Board of Directors Meeting, Sheraton Hotel; Annual Membership Meeting, Conrad Hilton Hotel, Chicago, Ill.
6-9—Executive Committee, American Trucking Assns., Conrad Hilton Hotel, Chicago, Ill.
6-11—American Trucking Assns., Annual Convention, Conrad Hilton Hotel, Chicago, Ill
14-16—Truck Body and Equipment Assn., Annual Meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

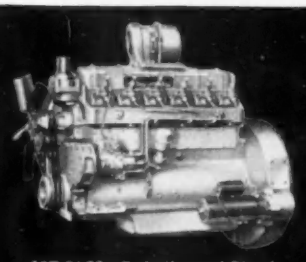
THE PAYLOAD POWER PLANT

- fast
- smooth
- powerful

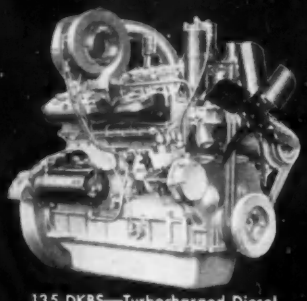
MODEL	Cyl.	*Features	Bore and Stroke	Displ. Cu. In.	Max. Torque @ RPM	Max. HP	RPM
TURBO-SUPERCHARGED DIESELS							
197-DLCS	6	AT	4 x4	320	280-2000	131	2800
135-DKBS	6	ACTV	4¼x5	426	400-1800	185	2800
148-DKBS	6	ACTV	5¼x6	779	706-1800	280	2100
WAKDBS	6	ACTV	6¼x6½	1197	1062-1600	352	1800
NORMAL DIESELS							
180-DLC	4	AC	3½x3¾	144	102-1800	45	2400
185-DLC	6	A	3½x3¾	216	152-1200	60	2400
190-DLCA	6	AC	3¾x4	265	191-1400	85	2800
195-DLCA	6	AC	4 x4	302	221-1800	98	2800
135-DKB	6	ACV	4¼x5	426	328-1600	147	2800
148-DKB	6	ACV	5¼x6	779	584-1000	200	2100
WAKDB	6	ACV	6¼x6½	1197	845-1000	258	1800
GASOLINE							
180-GLB	4	AC	3½x3¾	144	118-1600	45	2400
185-GLB	6	A	3½x3¾	216	176-1400	67	2400
190-GLB	6	A	3¾x4	265	220-1200	77	2400
195-GKA	6	ACV	4¼x4	320	243-1600	122	3000†
MZA	6	A	4¼x4¾	404	289-1000	128	2800†
135-GKB	6	ACV	4¼x5	426	337-1200	147	2800†
135-GZB	6	ACV	4⅜x5	451	354-1200	153	2800†
140-GKB	6	ACV	4½x5½	525	425-1000	177	2600†
140-GZB	6	ACV	4⅝x5½	554	448-1100	188	2600†
145-GKB	6	ACV	5¼x6	779	595-1000	240	2400†
145-GZB	6	ACV	5⅜x6	817	630-1100	250	2400†
WAKB	6	ACV	6¼x6½	1197	1000-1000	280	1800

*FEATURES: A—Aluminum Alloy Pistons; C—Counterbalanced Crankshaft; T—Turbo-Supercharged; V—Vibration Dampener.

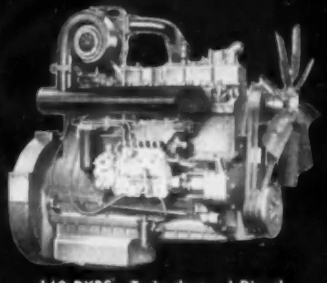
†These engines rated at higher hp and rpm for fire engine service. *Send for Bulletin 1079 for LPG ratings and complete listing of engine hp and speed ratings.*



197-DLCS—Turbocharged Diesel



135-DKBS—Turbocharged Diesel
(Also normally aspirated)



148-DKBS—Turbocharged Diesel
(Also normally aspirated)

WAUKESHA ENGINES

NORMAL and TURBOCHARGED DIESELS . . . GASOLINE . . . LP GAS
Standard or Counterbalanced Crankshafts

Truck powered by Waukesha 148-DKB Normal Diesel

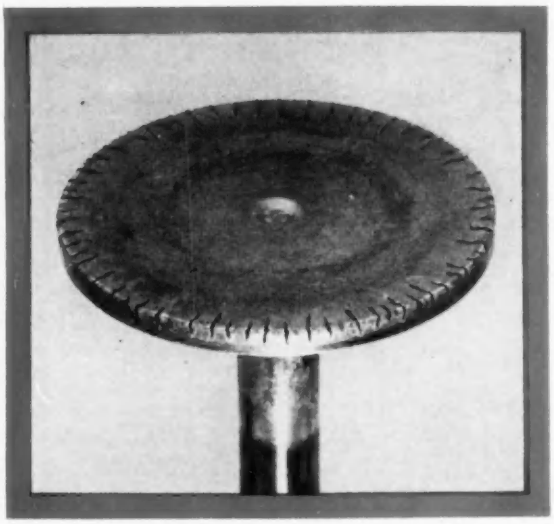
Write for descriptive bulletins
WAUKESHA MOTOR COMPANY
Waukesha, Wisconsin
New York • Tulsa • Los Angeles

349

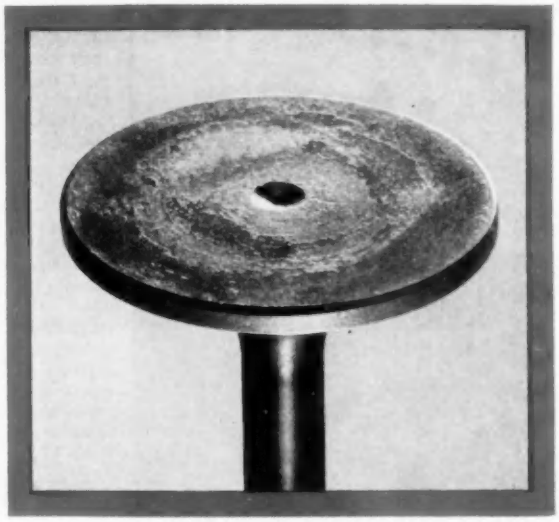
Accelerated Engine Test Comparison Proves

EATON SUPER-ALLOY VALVES LAST MANY TIMES AS LONG

AS VALVES MADE FROM COMMONLY USED ALLOYS



COMMONLY USED ALLOY
Failed at Less than
600 Hours

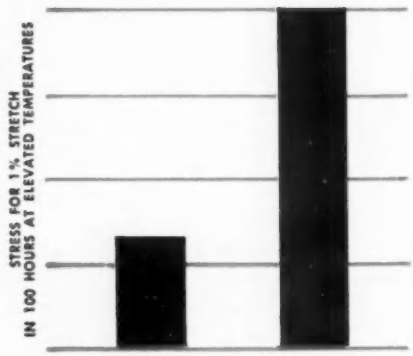


EATON SUPER-ALLOY
in Excellent Condition
after 3000 Hours

To meet the requirements of extreme heavy duty service, Eaton has developed unique production methods for the making of exhaust valves of super-alloys possessing exceptionally high hot-strength and corrosion resistant properties. These Eaton Super-Alloy Valves are "custom tailored" to meet the specific requirements of the engines for which they are designed.

As a pioneer in the development of valve designs and materials which have added thousands of miles to valve life expectancy, Eaton has made such important contributions as sodium cooled valves, seat-faces of high-alloy materials, aluminized valves, and now super-alloy valves.

If you build engines—either gasoline or diesel—for heavy duty applications such as motor trucks, buses, earth moving machinery —it will pay you to discuss the advantages of Eaton Super-Alloy Valves with our engineers.



The results of laboratory tests represented by the above graph indicate the superior hot-strength of Eaton Super-Alloys over commonly used exhaust valve materials.

EATON

VALVE DIVISION
MANUFACTURING COMPANY
9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioning Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

IF YOU'VE BEEN REBUILDING AIR BRAKES YOURSELF, LET US PROVE WHY IT DOESN'T PAY!

Bendix-Westinghouse Repair Exchange Service provides fully guaranteed, like-new units at low cost!

If you've been rebuilding your own Bendix-Westinghouse Air Brake equipment, our repair exchange program can save you plenty of money and time.

You'll save money because the only cost to you is a low, flat-rate price based upon inspection of your old unit. Our mechanics rebuild all devices to factory-new specifications, replacing worn parts or those subject to deterioration with brand-new parts of the latest design. All units are rigidly inspected and tested and *carry the same warranty as brand-new devices!*

You'll save time because you simply call or drive into your nearest Bendix-Westinghouse distributor's and have your old, mileage-worn air brake equipment replaced with genuine factory-rebuilt units. Installation can be done at your convenience, with the result that your truck is back in service fast.

Truck operators have used this service for more than 20 years because it assures them of the finest rebuilding job they can get at a money-saving price. For complete details contact your Bendix-Westinghouse distributor.

Bendix-Westinghouse BENDIX-WESTINGHOUSE AIR BRAKES® **AIR BRAKES**

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY • General Offices & Factory—Elyria, Ohio • Branches—Berkeley, California and Oklahoma City, Oklahoma

Fleetman's LIBRARY

FOR FREE ITEMS INCLUDED IN THIS REVIEW OF CURRENT MAINTENANCE AND SAFETY PUBLICATIONS, USE READER SERVICE POSTCARD ON PAGE 182

Engine Tune-Up Manuals

To help you get the most from your engines, here is a list of selected tune-up manuals as available from the various manufacturers and other sources.

AEA Tune-Up Manual is a fully illustrated manual discussing engine tune-up and the reasons for the various operations. Order it from Automobile Electric Assn., 16223 Meyers, Detroit 35, Mich. Price is $1 per copy.

Automotive Electrical Systems, AEA Technical Training Manual, Vol. 1, covers automotive electrical fundamentals including detailed data on the construction and operation of the electrical system and its components. Price is $1, and it can be ordered from the address given above.

Automotive Fuel Systems, AEA Technical Training Manual, Vol. 2, covers service on fuel pumps, carburetors, air cleaners and governors. Price is also $1, and it can be ordered from the address given above.

Operation and Maintenance Handbook, No. DR-324, is a 200-page book on operation and maintenance of Delco-Remy electrical systems and components. Price is $1.50. Order it from Technical Literature Section, Delco-Remy Division, General Motors Corp., Anderson, Ind., or United Motors System, 3044 West Grand Blvd., Detroit 2, Mich.

Maintenance and Operation Manual, No. S-24C, covers in 178 pages Electric Auto-Lite electrical and ignition systems and components. Order it from Parts and Service Division, Electric Auto-Lite Co., Toledo 1, Ohio.

Servicing Auto-Lite Generator Regulators, No. SD-123, is a 62-page manual that can be ordered from the address above at 25¢ a copy.

Alternator System Operation and Test Procedures, Training Manual No. 6, covers in 13 pages the basic facts of the Leece-Neville alternator system. It's free by writing Technical Service Dept., Leece-Neville Co., 1374 East 51st St., Cleveland 3, Ohio.

Blue Streak Voltage Regulator Manual is a booklet on what to watch for in installing a voltage regulator. Price is 25¢ when ordered from Standard Motor Products, Inc., 3718 Northern Blvd., Long Island City 1, N.Y.

Engine Principles and Automotive Tune-Up Fundamentals is a complete textbook on engine operation and tune-up — ignition, compression, timing, carburetion. Price is $2. Order it from Education Dept., Holley Carburetor Co., 11955 East 9 Mile Rd., Van Dyke, Mich.

Dynamometer Diagnosis and Adjustment Procedure for Cummins Diesel-Powered Trucks, No. C-566, covers diagnosis and adjustment in checking road horsepower, performance and routine inspection. It's free from Clayton Mfg. Co., Advertising Dept., Box 550, El Monte, Cal.

Fuel Pump Shop Manual, No. A-1919, covers testing, troubleshooting and overhauling various types of fuel pumps. It's free by writing Merchandising Dept., AC Spark Plug Division, General Motors Corp., 1300 North Dort Highway, Flint 2, Mich.

Fuel Pump Service Manual covers in 16 pages service, operation, checking, maintenance and testing of Hygrade fuel pumps. It's free from Advertising Dept., Hygrade Products Division, Standard Motor Products, Inc., 37-18 Northern Blvd., Long Island City 1, N. Y.

Truck PR Handbook

Just available is the 1957 edition of **Motor Truck Facts** from Automobile Manufacturers Assn. Within its 56 pages are a multitude of facts about the nation's truck fleet. You'll find specific proof for the claim that the country depends on trucks.

Truck taxes are fully covered to show that trucks pay their way. For example, just one of the many tax facts given is that they paid $2.14 billion in special taxes in 1956. Other items covered include truck registration, use, employment, mileage and safety.

For your free copy, circle L 1 on the postcard on page 182.

Film Catalog

General Motors Corp. is now sending out its 1957-58 film catalog. It lists 58 training, safety, educational and public relations films. **For your free copy, circle L 2 on the postcard.**

Two-Way Radio Directory

This new directory lists the name and address, transmitter location, call letters, number of authorized mobile units and operating frequencies of 2-way radio in use by taxi fleets, auto emergency, highway trucks, motor carrier, urban transit, railroads, intercity bus and citizens service. Listing is by frequencies and by name of licensee arranged by state. It comes from Communication Engineering Book Co., Monterey, Mass. Price is $4.00.

(FOR RECENT MANUFACTURER'S LITERATURE, SEE PAGE 178)

TACHOGRAPHS ARE BASIC TO MORE ECONOMICAL FLEET OPERATIONS

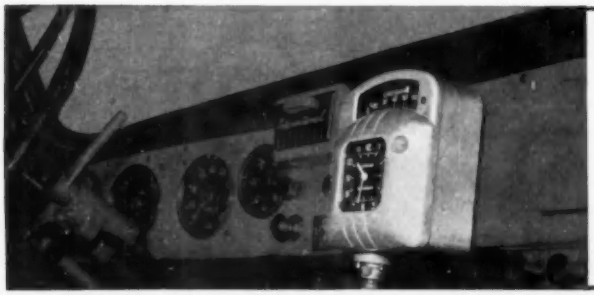
. . . considered as essential equipment on all vehicles operated by hundreds of profit-minded fleet operators coast-to-coast

Over the years, Tachographs have more than proved their worth to cost-conscious truckers. Their investment in this time-tested recording speedometer has been the key to promoting greater safety, making possible larger fuel and tire savings, establishing better routes and protecting driver and company in court cases.

Each day, or before every run, a wax-coated chart is placed inside the tamper-proof Tachograph. It is on this chart that vital trip information is permanently recorded: when engine idled . . . when vehicle was in motion . . . how fast it traveled . . . when it stopped and for how long. It also provides a graphic record of the time of day and total mileage. A red warning light signals the driver whenever your predetermined maximum speed is exceeded.

Tachographs are an important investment in the future safety and economy of your fleet. Models are available in two types: M.P.H. and R.P.M. Drivers like Tachographs in their cabs—they know that the record on the chart shows the front office proof of their good driving habits.

Mail the coupon below for your copy of Bulletin SU-3 . . . it tells how Tachographs can profitably fit into your fleet operation.



Wagner Electric Corporation
6476 PLYMOUTH AVE., ST. LOUIS 14, MO.
Please send a copy of Bulletin SU-3.

Name and Position_____
Company_____
Address_____
City_____ State_____
We operate_____ (NUMBER) Vehicles

S57-I

LOCKHEED HYDRAULIC BRAKE PARTS and FLUID • CoMoX BRAKE LINING • HoRoL • AIR HORNS • AIR BRAKES • TACHOGRAPHS • ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL CRANE BRIDGE BRAKES

PATENTED "KISS" WORTH 50,000 EXTRA MILES!

New tread invention makes Armstrong Miracle S-D Tires roll instead of scuff . . . to set amazing over-the-road mileage records!

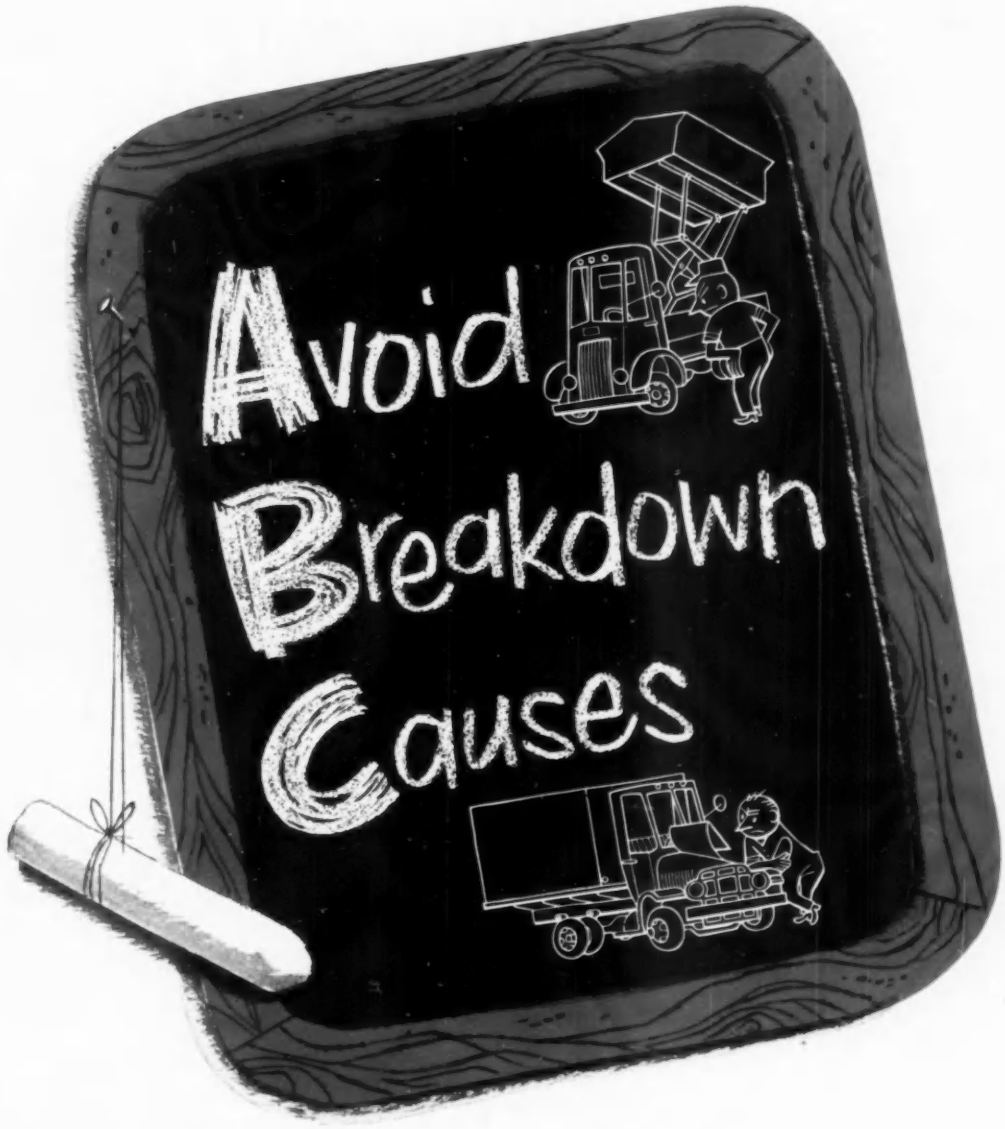
When you run *your* first tests on these sensational new tires, be prepared for a pleasant surprise. They'll probably show up to 50,000 miles more than you normally expect, before recapping! That's the actual experience of truckers who have used them.

The reason is — these tires "kiss the road". Tire engineers have long known that while a tire *rolls* freely, tread wear is negligible. But when tread is dragged, even a fraction of an inch, scuffing causes rapid wear.

Miracle S-D Tires lick scuffing two exclusive, patented ways. Interlocking sipes (see diagram) let the tread "kiss" the road hello and goodbye. Intratread bumpers prevent "rocking" — add stability so that the deep treads can't weave. The effect on mileage is phenomenal . . . and drivers love the improved traction and steering. Let us give you the facts and arrange a test.

ARMSTRONG
MIRACLE S-D
TRUCK TIRES

The Armstrong Rubber Co.,
Home Office,
West Haven, Conn.



It's as simple as ABC with Socony Mobil's Correct Lubrication Program

Join the cost-conscious fleet owners who have discovered this efficient way to keep equipment on the road . . . out of the shop!

A. Famous quality products—*Delvac Oils*—for all gasoline and Diesel engines. *New Mobilube GX*—Multipurpose-type Gear Lubricant—provides widest range of protection yet for axles, transmissions. *Mobilgreases*—types and grades for all chassis parts, engine accessories.

B. Lubrication engineering service—Includes analysis of your fleet conditions . . . advice on lubrication schedules and inspection periods . . . services of expert lubrication engineers when necessary . . . progress reports on benefits achieved. This complete service, plus our research facilities and 91 years of experience, is yours *with Mobil.*

C. Simplified P.M. system—This easy-to-follow system minimizes record keeping. You work with only a Record Folder . . . Work Sheet . . . Control Blackboard. We supply folders, work sheets—show you how to use them. You can practically eliminate breakdowns due to improper lubrication maintenance!

SOCONY MOBIL

Leader in lubrication for over 91 years

Mobil

Correct Lubrication

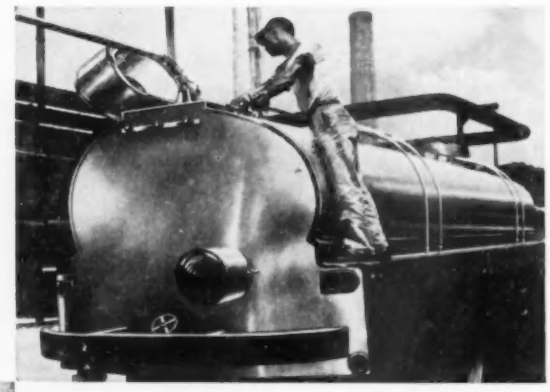
A proved program to reduce fleet maintenance costs!

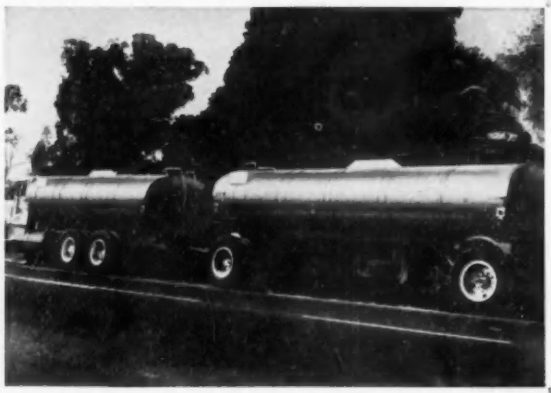
SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

Get This Evidence That Stainless Tanks Boost Profits Because They're Versatile

Fleets that haul cargoes like yours are becoming more versatile—stepping up profits—by using stainless steel tanks. A few examples on this page tell you how.

For more case-history evidence of the all-around cargo flexibility of truck and trailer tanks made of stainless steel, just fill in and mail the coupon. We'll send you the fact-packed booklet, *"Make Your Tank Fleet Versatile—Go Stainless."*





HAULS MOLTEN CHEMICALS

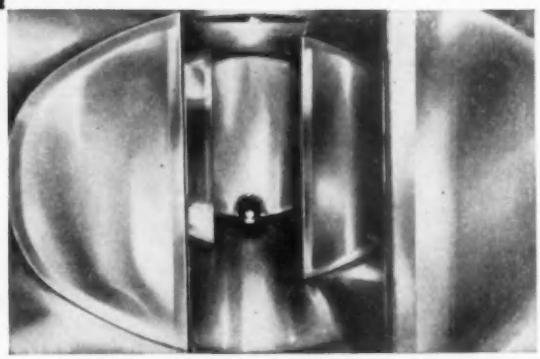
This stainless steel tank hauls a chemical in the hot, molten state. Result: Formerly it had to be solidified into crystals and bagged for shipping. Result: The tank fleet has new business—the chemical producer saves time and money.

PETROLEUM FLEETS PROFIT

Stainless tanks carry two-way payloads, eliminate sedimentation tests for aviation fuel, push profits up in petroleum-hauling fleets.

KEEPS FOODS SANITARY

It's easy to meet stringent 3-A Sanitary Standards with properly-designed stainless steel tanks.



ARMCO STEEL CORPORATION
1117 Curtis Street, Middletown, Ohio
Send me the new booklet—
"Make Your Tank Fleet Versatile—Go Stainless."

Name_____
Title_____ Firm_____
Street_____
City_____ Zone_____ State_____

ARMCO STEEL CORPORATION

1117 Curtis Street, Middletown, Ohio • Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

Producers of Armco Stainless Steels

"We've found them tops in quality, workmanship and performance in both light and extreme heavy duty use."

ANDREW KRIZANICH
Wetterau Grocer Co., Inc.
St. Louis, Mo.
Shop Superintendent

That's why the Wetterau Grocer Co., Inc. fleet of trucks uses

McQUAY-NORRIS BEARINGS

TWELVE YEARS OF EXPERIENCE HAVE CONVINCED ANDREW KRIZANICH:

"I find that with the fast life we live today we can't seem to find time to be good neighbors.

"We use a manufacturer's product and if it is good we don't say a word about it, but on the other hand if it is bad we sure take time out to let some one know about it. I for one would like to change this pattern somewhat.

"I have been using McQuay-Norris rod and main bearings in our blue diamond and red diamond International trucks here at Wetterau Grocer Company for the past twelve years and have found them tops in quality, workmanship and performance in both light and extreme heavy duty use.

"We service approximately 40 power units in our St. Louis shop, and we never hesitate to use McQuay-Norris bearings on our overhauls as we know we are installing the best quality that money can buy. We also find that by using McQuay-Norris bearings we have the added insurance of having the best engineering knowledge as close as our telephone, or as close as our jobber salesman.

"I would not hesitate to recommend this product to anyone in the automotive business."

McQUAY-NORRIS

Manufacturing Company St. Louis • Toronto

APPROVED ORIGINAL EQUIPMENT FOR CARS, TRUCKS, BUSES AND TRACTORS

1957 New Truck Registrations

STATE AND MONTH		Brock-way	Chev-rolet	Dia-mond T	Dodge	Ford	G.M.C.	Interna-tional	Mack	Reo	Stude-baker	White	Willys Jeep	Willys Truck	All Others	Total
Alabama	Apr.	1	614	7	58	545	159	113	51	3	3	17	3	9	20	1,603
	4 Mos.	1	2,169	13	185	1,696	554	471	135	11	13	61	14	31	44	5,398
Arizona	Apr.		329	1	64	354	78	36	1	1	1	8	9	17	22	921
	4 Mos.		960	4	204	959	300	179	12	2	37	17	20	61	72	2,827
Arkansas	Apr.		437	2	54	486	127	103	11		9	18	1	2	4	1,254
	4 Mos.		1,930	11	255	1,684	522	468	35		52	23	13	19	7	5,019
California	Apr.		2,564	46	491	3,253	585	496	29	13	65	66	70	100	419	8,197
	4 Mos.		10,386	95	1,796	11,274	2,238	2,045	75	75	275	232	228	419	1,275	30,413
Colorado	Apr.		335		45	363	82	98	17		9	10	30	35	14	1,038
	4 Mos.		1,197	13	192	1,181	356	455	41	9	39	32	79	155	58	3,807
Connecticut	Apr.	1	198	14	53	228	43	139	45	3	9	26	7	19	19	804
	4 Mos.	6	560	27	156	561	155	326	79	15	28	71	38	88	71	2,181
Delaware	Apr.	1	101	3	14	53	11	28	12	1	2		1	3	2	232
	4 Mos.	5	307	11	66	176	93	93	25	3	8	37	6	11	6	847
District of Columbia	Apr.		113	1	10	68	15	43	2	2		2	1	9	13	279
	4 Mos.		310	1	33	194	43	94	10	2	3	6	3	31	26	756
Florida	Apr.		840	6	121	959	188	173	42	14	15	52	27	63	93	2,593
	4 Mos.	1	3,154	40	440	2,872	699	763	187	57	76	173	70	240	259	9,031
Georgia	Apr.		495		47	517	193	157	34	7	10	20	8	15	6	1,509
	4 Mos.		2,574	43	287	1,984	704	733	124	12	56	107	31	45	35	6,735
Idaho	Apr.		143		40	188	66	56	1	1	7	6	6	34	9	557
	4 Mos.		550	2	158	513	215	202	4	2	32	8	26	113	26	1,860
Illinois	Apr.		1,009	36	183	1,159	233	375	54	2	30	32	11	50	52	3,226
	4 Mos.		3,958	147	667	3,589	985	1,955	169	40	145	205	63	184	211	12,318
Indiana	Apr.		501	8	109	617	149	242	7	7	30	36	4	10	47	1,767
	4 Mos.		2,062	53	435	2,075	536	1,044	89	33	157	183	26	68	119	6,860
Iowa	Apr.		402	6	50	466	57	188	10	6	11	13	2	2	9	1,222
	4 Mos.		1,466	49	231	1,481	343	710	33	7	50	39	9	43	75	4,535
Kansas	Apr.		503	8	59	658	111	164	3	3	12	19	2	16	11	1,589
	4 Mos.		1,599	19	177	1,589	310	489	11	4	53	63	9	45	19	4,387
Kentucky	Apr.		464	9	55	403	144	89	10	4	9	9	3	23	9	1,231
	4 Mos.		1,608	13	205	1,262	472	423	43	15	41	34	30	70	30	4,246
Louisiana	Apr.		601	4	74	850	124	142	21		5	22	5	12	6	1,666
	4 Mos.		2,978	21	306	2,390	505	628	63	36	43	53	37	47	32	7,139
Maine	Apr.		70		28	78	25	36	4		4	1	12	12	9	279
	4 Mos.	4	292	2	86	282	106	245	34		23	14	54	102	23	1,267
Maryland	Apr.	2	374	3	96	371	64	93	26	13	12	44	5	12	26	1,141
	4 Mos.	9	1,134	13	243	964	225	350	89	24	37	84	14	54	53	3,293
Massachusetts	Apr.		263	10	70	376	105	131	27	5	2	24	11	24	40	1,088
	4 Mos.	6	925	20	255	1,099	279	532	66	11	20	105	68	162	140	3,688
Michigan	Apr.		750	17	219	1,105	205	158	24	19	15	25	17	40	57	2,651
	4 Mos.		3,554	55	783	3,311	775	643	85	45	65	91	55	164	207	9,833
Minnesota	Apr.		559	5	139	742	110	128	3	3	16	27	9	24	18	1,783
	4 Mos.		1,668	21	368	1,817	316	643	9	12	71	51	23	73	65	5,137
Mississippi	Apr.		370	2	49	396	90	132	11		6	1	8	8	7	1,060
	4 Mos.		1,644	5	174	1,415	385	539	29		33	8	13	27	13	4,285
Missouri	Apr.		789	3	73	666	194	211	13	2	12	42	5	10	13	2,033
	4 Mos.		3,095	17	320	2,329	744	827	41	11	69	160	18	34	70	7,735
Montana	Apr.		205	1	25	157	38	75	2		11	3	11	21	16	565
	4 Mos.		659	2	116	498	174	322	11		43	18	40	139	38	2,060
Nebraska	Apr.		288	11	25	308	54	82	2	1	3	15	4	7	17	817
	4 Mos.		958	36	101	854	226	417	20	3	19	52	20	32	39	2,777
Nevada	Apr.		49		6	79	13	12	2				3	3	5	172
	4 Mos.		435	2	45	308	99	55	5	1	32	1	17	39	23	1,062
New Hampshire	Apr.	1	179	2	39	229	83	131	14	1	11	2	12	37	37	778
	4 Mos.	3	260	2	83	289	113	181	23	1	18	4	23	73	49	1,122
New Jersey	Apr.	10	680	11	195	544	158	205	75	3	12	63	11	33	81	2,081
	4 Mos.	43	2,401	54	666	1,802	666	762	271	21	44	257	43	121	241	7,392
New Mexico	Apr.		138		15	101	39	33	1		4	12	3	2		348
	4 Mos.		1,027		72	399	206	178	11	10	21	18	18	46	5	2,011
New York	Apr.	22	1,365	23	484	1,511	423	605	148	27	46	130	54	145	315	5,298
	4 Mos.	81	3,865	73	1,411	2,956	1,172	2,003	408	118	113	391	229	538	675	14,033
North Carolina	Apr.		639	19	90	533	104	110	34		14	22	5	9	15	1,594
	4 Mos.		2,829	37	339	2,181	589	620	296	7	61	130	26	53	48	7,196
North Dakota	Apr.		133		26	174	40	80			8	1	1	2	4	468
	4 Mos.		431		84	512	117	294			21	1	4	16	10	1,490
Ohio	Apr.		921	9	283	1,271	225	314	72	17	24	111	13	55	42	3,357
	4 Mos.	1	3,598	39	967	4,010	832	1,421	289	64	113	374	82	280	221	12,291
Oklahoma	Apr.		569	4	50	544	114	109	8	3	10	17	5	5	11	1,449
	4 Mos.		1,849	4	158	1,575	363	475	31	16	31	79	14	25	39	4,659
Oregon	Apr.		375	7	65	359	129	111	62	8	31	32	18	43	112	1,352
	4 Mos.		1,516	15	267	1,246	443	558	75	21	98	120	60	220	342	4,981
Pennsylvania	Apr.	10	919	9	238	907	228	326	108	8	37	64	35	82	26	2,997
	4 Mos	45	3,194	50	937	3,084	769	1,438	411	43	144	257	146	417	103	11,038
Rhode Island	Apr.	1	52		19	62	12	43	13	1	1	25	3	3	12	247
	4 Mos.	1	164	5	48	182	40	94	34	6	2	36	15	8	30	565
South Carolina	Apr.		237		30	303	42	56	15	1	4	5	3	6	5	707
	4 Mos.		1,053		138	1,068	203	207	45	1	13	24	16	26	20	2,814
South Dakota	Apr.		93	1	23	120	51	203	7	1	3		2	9	6	519
	4 Mos.		439	5	75	409	149	426	7	3	12	1	18	45	14	1,601
Tennessee	Apr.		501	4	96	502	134	123	31	1	3	23	10	8	7	1,443
	4 Mos.		2,001	22	314	1,664	503	535	118	6	23	54	16	38	23	5,315
Texas	Apr.		2,192	20	178	2,114	320	467	76	6	34	95	17	22	19	5,559
	4 Mos.		9,404	72	823	7,258	1,416	2,086	344	24	125	492	88	130	132	22,394
Utah	Apr.		105	1	27	120	33	47	6	1	5	2	5	16	18	386
	4 Mos.		528	11	95	458	142	141	11	4	20	11	9	62	60	1,552
Vermont	Apr.	2	108	1	32	121	59	85	11		8	1	7	27	7	489
	4 Mos.	3	210	4	61	213	95	130	14		17	1	33	78	17	875
Virginia	Apr.		607	1	128	562	131	184	25	4	28	25	11	30	31	1,767
	4 Mos.		1,964	2	364	1,678	428	594	176	13	77	140	51	143	75	5,705
Washington	Apr.		254	3	39	274	76	76	10		4	12	3	15	49	815
	4 Mos.		1,327	43	256	1,139	433	463	41	8	53	26	23	101	196	4,107
West Virginia	Apr.		216	2	39	165	64	53	5	1	12	12	18	21	15	623
	4 Mos.		854	3	192	631	262	270	32	8	50	45	75	135	28	2,585
Wisconsin	Apr.		486	3	81	473	117	219	28	5	25	34	4	22	42	1,539
	4 Mos.		1,495	6	248	1,281	337	737	77	18	65	55	19	87	144	4,569
Wyoming	Apr.		90		13	112	47	44	2		3	3	6	22	3	345
	4 Mos.		430	2	52	354	146	196	14		19	7	17	75	10	1,322
Total	April, 1957	51	24,225	323	4,447	26,346	5,892	7,344	1,215	197	635	1,228	521	1,194	1,820	75,438
Total	April, 1956	128	27,531	386	5,076	25,073	7,516	9,950	1,251	293	857	1,540	717	1,285	1,094	82,699
Total	4 Months, 1957	209	92,960	1,184	15,934	82,746	21,763	29,466	4,232	821	2,660	4,451	2,047	5,209	5,518	269,214
Total	4 Months, 1956	337	98,255	1,368	17,827	85,685	29,514	35,450	4,225	945	3,395	5,301	2,535	4,222	3,450	291,509

Data from R. L. Polk & Co.

If it travels on wheels, Raybestos can help you cut the operating cost-per-mile

Woven Molded Brake Blocks

Raylok & Ray-Metl Clutch Facings

PGT Heavy Duty Truck Sets

V-Drive & Automatic Transmission Plates

Full Molded Brake Blocks

Raybestos

AMERICA'S BIGGEST SELLING FRICTION MATERIAL

RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., Bridgeport, Conn.

RAYBESTOS-MANHATTAN, INC., Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Industrial Rubber • Engineered Plastics • Sintered Metal Products • Rubber Covered Equipment • Asbestos Textiles • Laundry Pads and Covers • Mechanical Packings • Abrasive and Diamond Wheels • Industrial Adhesives • Bowling Balls

1 EXCLUSIVE TECHNICAL HELP

Your Champion sales representative is technically trained to help and advise you. He is backed up by a team of Champion Field Engineers, who are recognized spark plug and ignition experts. They, in turn, are supported by the world's largest engineering and research department devoted exclusively to spark plugs. All of these specialists assure you that with Champion, you'll always get the technical help you may need.

Champion Service Tips for Better Performance

FICTION:

Premium fuels cause spark plug fouling.

FACT:

Deposits on spark plugs which cause shorting and misfiring are practically always formed during idling or long periods of slow speed city driving. Newer high-powered engines may have to have their plugs cleaned more often because these engines use proportionately less of their available power at low speed —thus tend to run the plugs too cold at low speed. Use the fuel grade for which the engine was designed. "Exercise" the engine on the highway occasionally. Have the plugs cleaned once in a while.

FICTION:

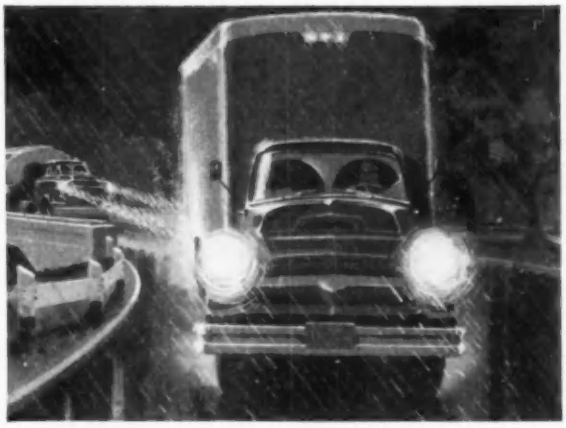
In a bench test, plugs have to fire up to a pressure corresponding to engine compression.

FACT:

Engine compression has no direct relation to the quench pressure in a bench test. There are too many variables involved:

(*1*) wider plug gaps will quench at lower air pressures, (*2*) voltage output of the tester may be low, (*3*) line voltage to the tester may be down. For such reasons, spark testing of plugs at arbitrary air pressures can be misleading. To eliminate the effect of these variables, determine the point of "100% sparking efficiency" with a new plug of the same type and gap as the used plug. Then set the movable dial of the Champion Comparator to this value. (It's not broken—it's supposed to rotate!) The relative efficiency of the used plugs can then be measured against this norm. By the way, never try to check a plug until it has been cleaned and the gap filed and reset.

Four reasons why your fleet should use Champion Spark Plugs

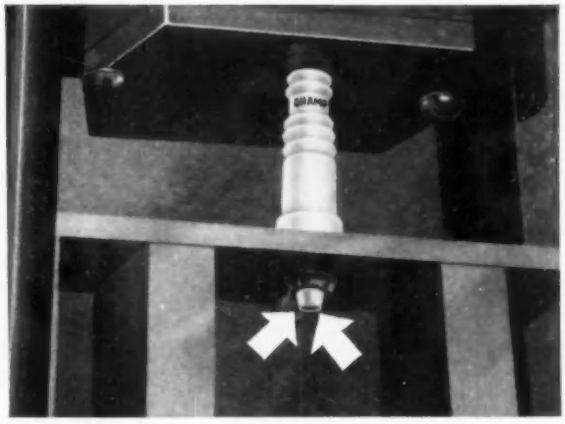


3 MAXIMUM LIFE

New Champions with the Powerfire electrode have been found to stand up far better under heavy-duty operations—according to reports from operators who say they give maximum spark plug life. Tests proved new Champions last on an average of *3* times as long—with such specific improvements as 180%, 320%, 228% over former spark plug life!

2 PRODUCT UNIFORMITY

Each Champion Spark Plug is carefully inspected under a rigid inspection control system for quality and product uniformity. This assures more uniformly dependable performance. Because of this and the fact that Champions have a wider heat range which cuts danger of fouling or burning, you can count on less downtime on the road or in the shop.



4 IMPORTANT PRODUCT FEATURES

When you use Champion Spark Plugs, you appreciate such important features as Champion's durable insulator. The above illustration shows a standard Champion 5-rib insulator being driven through a quarter-inch steel plate under a pressure of 6850 lbs. Here is visible proof that Champion insulators won't crack or split in normal service!

Dependable 5-Rib

CHAMPION

SPARK PLUGS

CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

CLEAN EQUIPMENT IS GOOD ADVERTISING

• Brushes with TYNEX nylon bristles are economically keeping the huge Kroger Company fleet consistently clean. (*Wilson Train and Van Washer manufactured by the Ross and White Company, Chicago, Ill.*)

Whatever your industry . . .

You get money-saving top performance from brushes with Du Pont TYNEX® nylon bristles

A mobile washer using brushes with TYNEX nylon bristles is being used by the Kroger Company, Columbus, Ohio, a large supermarket chain, to wash 80 of their 800 trailers daily. Previously, one man could hand-wash only 16 trailers per day.

The results have been so satisfactory that the Kroger people have ordered another washer to facilitate their trailer-cleaning operations. The all-important brushes will again be bristled with TYNEX. These brushes clean the equipment thoroughly because they remain firm yet flexible . . . absorb very little water. And since brushes with TYNEX nylon bristles will not mat, they cannot retain the harmful grit particles which abrade metal surfaces.

Brushes with TYNEX nylon bristles last many times longer than brushes with ordinary bristles, even when in contact with heat, rough surfaces, water, detergents and oils. Supervisors of maintenance in many industries find that these brushes, although higher in initial cost, actually save them money in terms of longer service and top performance.

Brushes with TYNEX nylon bristles can be the efficient, economical answer to your brush problems. If you would like more information, just mail the coupon below.

Specify brushes with

TYNEX®

nylon bristles

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

TYNEX *is the registered trademark for Du Pont nylon bristles.*

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Department, Room 807, Wilmington 98, Delaware

I would like to learn more about the advantages of TYNEX nylon bristles in brushes for industry. My specific brush problems are:

_____
_____
_____

Name_____
Title_____
Firm_____
Nature of Business_____
Address_____
City_____ State_____

In Canada: Du Pont Company of Canada (1956) Limited, P. O. Box 660, Montreal, Quebec.

Laugh it off!

SLIM 'N GREASY SAYS: "WHEN YOU'RE SITTIN' ON THE OLD SOFA WITH YOUR BEST GIRL FRIEND, ACTIONS SQUEAK LOUDER THAN WORDS."

CCJ

Wifey: "Herman, will you please come here and zip up my corset."

Truck Dispatcher: "Aw, I'm busy."

Wifey: "Humph! There was a time when you'd jump at the chance."

Truck Dispatcher: "Yeah, I know, but that was before the bottom fell out."

CCJ

First Fleet Operator: "I hear you've got a scrumptious new honeybun on the string. Is she blonde, brunette or redhead?"

Second Fleet Operator: "She's a redhead. And one of the most versatile gals it has been my pleasure to know. Does everything well from driving a car, to golfing, swimming and . . . well, you know. She's the epitome of femininity but on the other hand she's a regular fellow."

First Fleet Operator: "Game for anything, huh?"

Second Fleet Operator: "Yeah, that's right. The other night she played strip poker with me and some of the fellows. The guy sitting next to her on the left, had a pat hand."

First Fleet Operator: "He did?"

Second Fleet Operator: "Yeah, and kept her busy most of the evening slapping it away from her."

CCJ

Tipsy Truck Mechanic: "Excush me, I thought you wush muh wife."

Indignant Lady: "You're a fine sort of husband for any woman to have, you stupid, drunken lout."

Tipsy Truck Mechanic: "There, you see? You even talk like her."

Steno Lou: "How're you making out in the race to matrimony, Susie?"

Steno Sue: "Oh, fine, I guess, Louisa. I have a hunch I'm on my last lap."

CCJ

The moon was yellow
The lane was bright;
As she turned to me
In the wintry night
And gave an invitation
With every glance
To satisfy her craving
For real romance.
I stammered, stuttered,
And time whizzed by
The moon was yellow—
And so wuz I.

CCJ

Young Lady: "Can you squeeze me in here?"

City Bus Driver: "Why, yes, ma'am, if someone else will drive the bus."

Cici Jay

"A screamingly funny thing happened to me . . ."

SLIM 'N GREASY SAYS: "WOMEN HAVE REACHED MIDDLE AGE WHEN THEIR SHOES PINCH THEM MORE OFTEN THAN MEN DO."

CCJ

Traveling Freight Auditor: "My seven-year-old son must be taking vitamin pills that are too strong for him."

Freight Claim Representative: "What makes you think that?"

Traveling Freight Auditor: "When I take the kid to a department store, he'd rather stand around the lingerie counter than go to see the toys."

CCJ

1st Diner Waitress: "I finally gave that new Fleety-Fleet Express truck driver a date the other night. And let me tell you something. He's the fastest worker in the world."

2nd Diner Waitress: "What happened?"

1sts Diner Waitress: "Well, I really said 'No' to the guy, but I happened to shake my head in the wrong direction and before I could get my head in reverse, it was too late."

CCJ

The traveling motor freight auditor was stranded with car trouble in a little cross roads hamlet. Striking up a conversation with one of the village idlers, he was astounded at the man's apparent wisdom.

"How is it that you are so well informed when all you do is sit around the square here all day whittling?"

"Oh," replied the country man, "I jist heered it here and thar an' wuz too lazy to fergit it."

Resume Work

MECHANICS — SUPERVISORS

It's easy to own these genuine Snap-on Tools

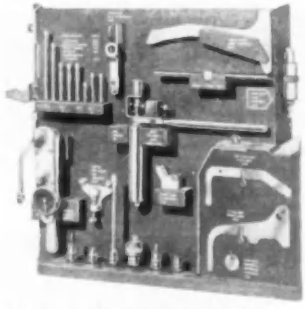
with Snap-on's new pay-as-you-earn plan

- TEN PERCENT DOWN
- LOW, CONVENIENT PAYMENTS

MECHANIC'S STANDARD SERVICE SET (5164-GS-B)
A big, 164-pc timesaving kit of tools. A basic set for every mechanic.
$34.45 down — only $7.07 a week

WHEEL ALIGNMENT SET (2033-WA-S)
All the tools you need to keep front-end alignment work in your own shop.
$40.40 down — only $8.28 a week

FERRET GENERAL SET (272-F-B)
72-pc set of useful handles and various sockets to speed many jobs. 3/8-in. square drive.
$12.25 down — only $2.44 a week



AUTOMATIC TRANSMISSION TOOL SET (2028-AT-S)
Handles most transmission jobs, quickly and surely. Pays for itself in a short time.
$11.10 down — only $2.24 a week

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Big, roomy, portable storage cabinet to take *Snap-on* tools right to the job.
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See the *Snap-on* man next time he's in your shop. Remember — the *Snap-on* Credit Plan applies to all the tools in the *Snap-on* line. Use the tools you need — pay for them with increased earnings.

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— Be sure to pass this advertisement to your mechanics.

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Campbell 66 Express, Inc., is "Humpin' to Please" throughout its extensive middle-western and southern states routes. The latest in modern equipment assures shippers of prompt and efficient delivery.

At Campbell 66

WILLIAM T. ROYSTON, Superintendent of Maintenance at Campbell 66 Express, Inc., put safety and durability right at the top of the list when asked why they chose ASF Safety 5th Wheels for all of their equipment—new and replacement! But he didn't stop there . . .

Q. Why did you choose ASF Safety 5th Wheels exclusively?

A. Probably among the most important reasons was the fact that they are so safe . . . and durable.

Q. What do you mean by safe?

A. We've *never* had a failure or breakaway with an ASF 5th Wheel. Our drivers prefer them because they grip the trailer at the top of the king-pin, reducing backlash. What's more, with the ASF double safety lock and safety latch the operator *always* knows when he has the wheel locked, just by looking at it.

it's ASF 100%

Q. What about durability?

A. ASF Safety 5th Wheels give us longer periods of use between rebuilds, longer service life per wheel, and big cuts in our maintenance costs.

Q. Any other ASF features that you like?

A. There sure are! With ASF we don't need a mounting plate. We end up with greater strength, save the cost of the plate, and get more payload. I'd recommend them to anyone.

Safety and durability *plus* lighter weight and low maintenance costs, all in one wheel—the ASF Safety 5th Wheel, safest and most economical your money can buy. Find out for yourself how you can cut operating costs with a new measure of safety by trying a test wheel on your own equipment. Contact your nearest ASF distributor, or write: American Steel Foundries, Hammond Division, Hammond, Indiana.

Make an investment in safety... with

ASF

safety 5th wheels

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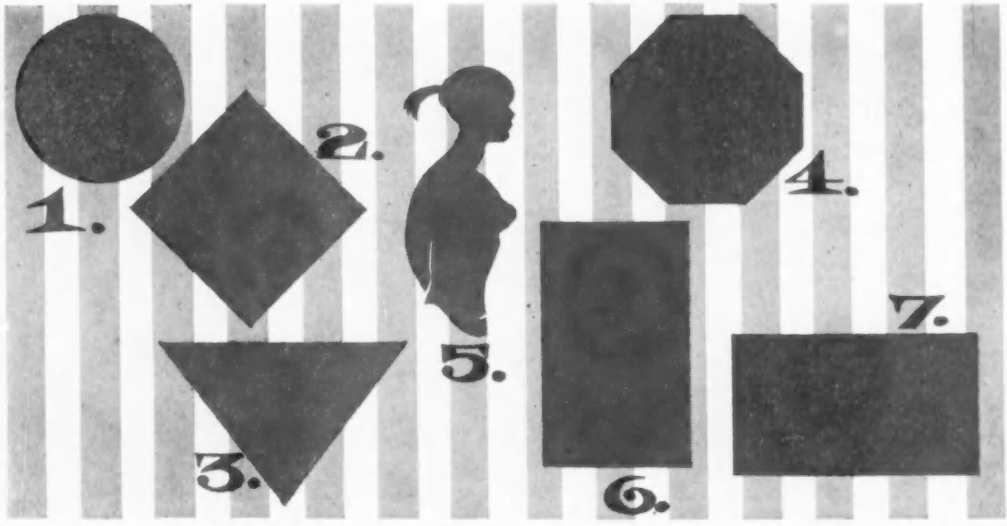
Shapes Worth Knowing

Here are several shapes you should be able to identify without a second look. They'll tell you when to slow down, when to be extra careful and what kinds of curves, grades and intersections lie ahead. You should know them all, and if you miss the answer to Number 5 you're just not trying!



1. Railroad Crossing. 2. Hazard. 3. Yield right of way. 4. Stop. 5. Aw come on, now. 6. Traffic regulation. 7. Road information.

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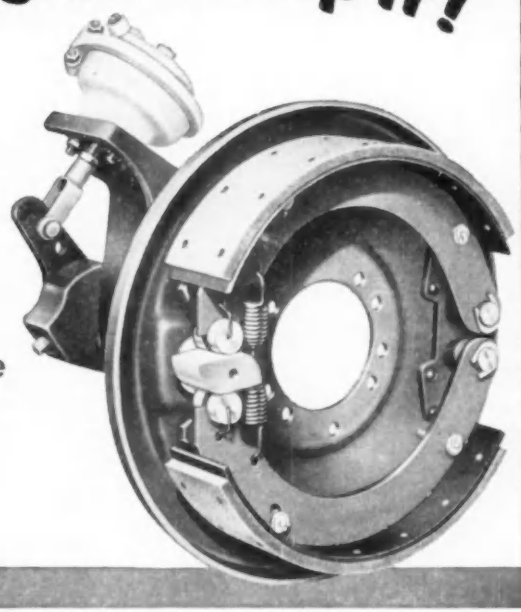
TDA® BRAKES

if it moves...we can stop it!

NEW "T" BRAKE

...an economical new air brake designed for a variety of automotive applications



Outstanding control for a modest investment is offered by the new "T" air brake. Ruggedly-built, dependable, and capable of long, trouble-free service, its economy is achieved principally through simpler design and improved manufacturing methods.

Air-actuated, the "T" Brake operates through a precision-forged, one-piece camshaft. The cam design provides a constant, equal rate of lift to both shoes. The entire camshaft is heat treated for maximum strength.

Fabricated steel brake shoes combine strength with lightness . . . hardened spool type cam rollers used with single-web, fabricated shoes provide perfect alignment with camhead. The roller, mounted in an open-type support, is always free to rotate. Brake linings are available up to ½" in thickness.

Other features include: quick, one-point adjustment; air chamber and camshaft brackets mounted on backing plate in one compact assembly; wide range of sizes and capacities.

For every industrial, agricultural or automotive application where braking is required!

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TIMKEN-DETROIT BRAKE DIVISION
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Timken-Detroit Brake Division
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Please send me further information on your "T" Brake.

Name _____ POSITION

Company _____

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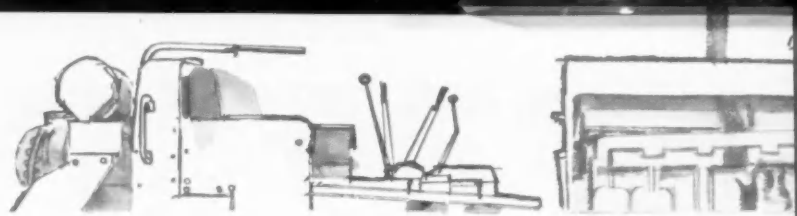
City _____ State _____



Builds seven-billion-gallon reservoir so

H. D. Tousley Co., builder of Morse Reservoir, uses one source for petroleum products—STANDARD OIL

Two miles northwest of Noblesville, Indiana, H. D. Tousley Co. built Morse Reservoir for the Indianapolis Water Company, one of the largest privately owned water utilities in the country. The reservoir impounds Cicero Creek to create a seven-billion-gallon reserve water supply for the city of Indianapolis. It was a $6.5 million job. The contractor did it with one supplier of petroleum products—Standard Oil. This is one of the reasons Tousley uses Standard Oil products:

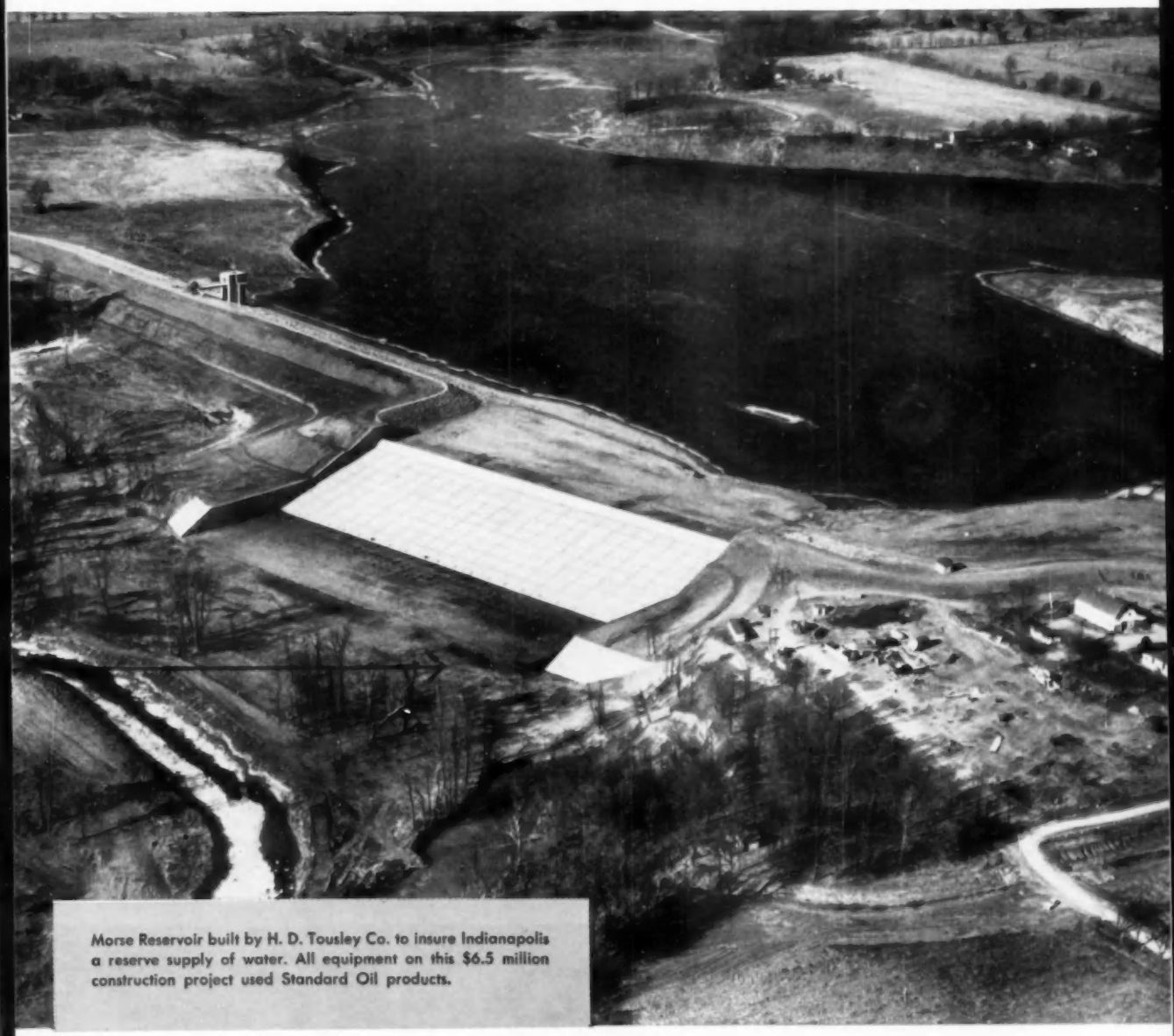
Standard Oil works direct with Tousley. On this job Standard Oil Company worked direct with the contractor. A Standard Oil bulk station only a few miles from the job made deliveries whenever needed, day or night. One of Standard Oil's 23 Division Offices located in Indianapolis gave help. Tousley maintenance men thus had no worries about service on diesel fuel, gasoline, motor oil, grease.

Lubrication technical service. Out of the Standard Oil Division Office, only 23 miles from the job, the Tousley Co. had the services of experienced lubrication specialists. On this project, Standard's chief automotive engineer and a lube specialist worked with job and equipment superintendents. They made a lubrication survey, recommended STANOLUBE HD-M Motor Oil and AMOCO* Lithium Multi-Purpose Grease for all equipment. They cut down the number of products Tousley needed to inventory, eliminated chance of application errors and saved the contractor money. The Tousley Co. has an impressive inventory of equipment—62 trucks and cars; 18 bulldozers, high-lifts and motor graders; 3 scrapers; 12 cranes and 12 air compressors. They stay in top condition because of the top maintenance given by the H. D. Tousley Co. and top lubrication technical service received from Standard Oil lube specialists.

Get this kind of service from Standard Oil anywhere in the 15 Midwest and Rocky Mountain states. Call your nearby Standard Oil office. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

F. E. Hull, Standard Oil chief automotive engineer (left), and M. B. Shookman, Standard automotive lubrication specialist (right), go over lubrication of Caterpillar drive with Tousley Co. maintenance superintendent, Jim Smith. Experienced Standard Oil men such as these give lubrication technical service to contractors. Forrest Hull has been doing this work for 13 years; Miles Shookman, for five years. Both men have completed the Standard Oil Sales Engineering School.

nobody goes thirsty in Indianapolis



Morse Reservoir built by H. D. Tousley Co. to insure Indianapolis a reserve supply of water. All equipment on this $6.5 million construction project used Standard Oil products.

Quick facts about Standard Oil products for construction equipment

STANDARD Diesel Fuels. Minimum-odor exhaust. Maximum engine cleanliness. Standard Oil handled from refinery to you.

STANOLUBE HD-M Motor Oil. Recommended for MS-DG Services. Refined from finest quality base stock. Additives prevent bearing corrosion, reduce piston varnish, keep rings free.

AMOCO* Lithium Multi-Purpose Grease. An all-purpose grease used wherever chassis, wheel-bearing or ball-bearing greases are specified. Resistant to heat and water.

STANDARD

STANDARD OIL COMPANY
(Indiana)

*Trade Mark AMOCO registered U. S. Patent Office by The American Oil Company and used by Standard Oil Company under license.

Most powerful, most economical V-8's

One of 9 reasons why fleets find International Trucks cost least to own!

Ton-mile costs go down, profits go up with new INTERNATIONAL V-8's that have the highest horsepower in any commercial truck. You get faster acceleration and higher average road speeds with less shifting . . . more miles per gallon on regular gasoline. Spend more time on the road, less time in the shop.

This is another example of INTERNATIONAL'S policy to build the best truck—to use only the finest parts and components with quality construction throughout—to spend more to build the truck so that it costs you *least* to own!

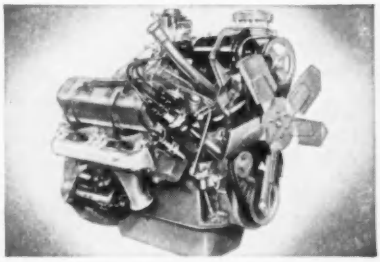
And INTERNATIONAL Trucks *do* cost *least* to own. This has been proved* by detailed fleet cost records.

Follow the lead of the men who know trucking costs to a penny . . . fleet operators who have made INTERNATIONAL the heavy-duty sales leader for the past 25 years. Make your next highway hauler an INTERNATIONAL Truck.

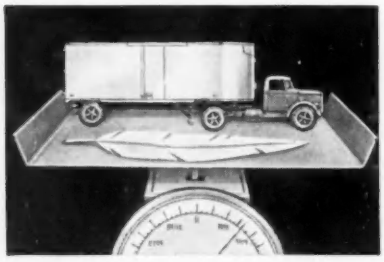
**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

INTERNATIONAL HARVESTER COMPANY, CHICAGO

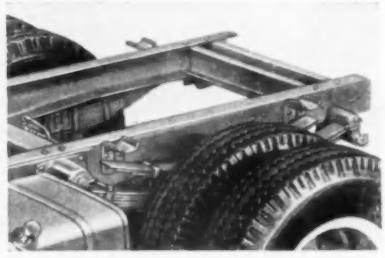
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



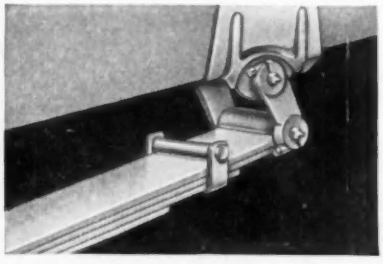
1 **Most powerful V-8's,** up to 257 hp. Full usable power at low rpm. Lasting, superior performance and low maintenance costs. Greater fuel economy. Other INTERNATIONAL gasoline, LPG and diesel engines with up to 356 hp.



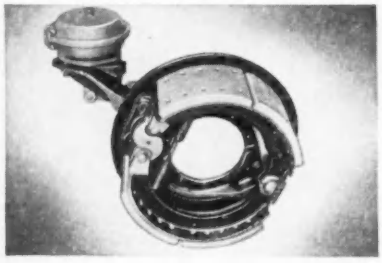
2 **Hundreds of extra payload pounds** are yours with lightweight construction that makes less metal do more work. Models available with aluminum frame and other weight-saving components. Space Saver cab for still more payload.



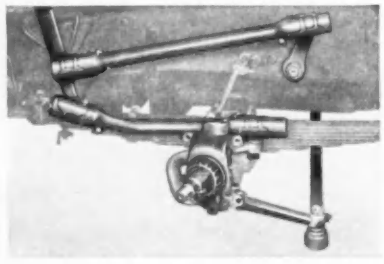
3 **Rugged frame** has plenty of sturdy crossmembers. Non-crystallizing, cold squeezed rivets are used for extra rigidity and proper flexibility on all types of service. Husky front and rear sections add to the safety margin built into every frame.



4 **Cradle action front and rear springs** cushion load and driver. Proper design and mounting provide better load support, smoother riding and longer spring life. Rear-shackled front springs for greater stability and increased life.

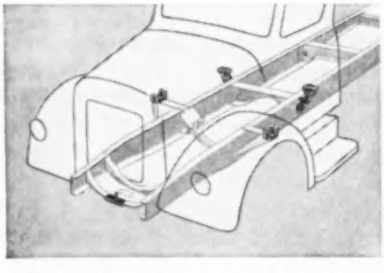


5 **Full air brakes** are standard or available on most models with lining areas to match the model, load and operating conditions. Twin-cylinder self-centering, self-energizing hydraulic brakes provide safer, easier stops and longer life.

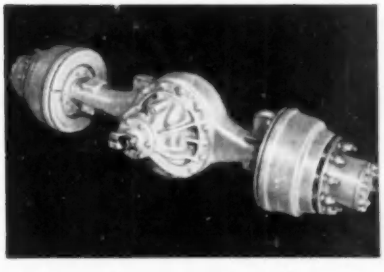


6 **Safer, easier steering** and greater maneuverability result from cam and twin lever gears with controls mounted *ahead* of front axle. Steering wheel is comfortably positioned. Power steering available on most models.

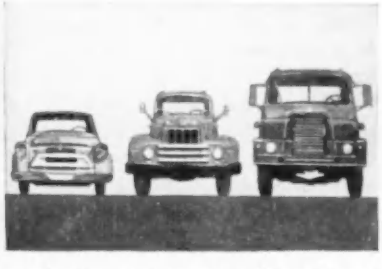
New INTERNATIONAL V-Line tractors are powered by 3 great new V-8 engines, 206, 226 and 257 hp. Offered in conventional and COE design, 4-wheel and 6-wheel models with GCW ratings up to 65,000 lbs. Other Roadliner® models have 29,000 to 76,800 lbs. GCW, engines that produce up to 356 hp. You name the job, INTERNATIONAL has the tractor exactly right for your over-the-road operation...“sized,” powered and geared to cost you *least* to own.



7 For cab comfort and long life. Quiet, level ride without transmitting stress to cab, fenders, hood or radiator. It's the result of wide spaced, rear shackle type cab mountings plus exclusive INTERNATIONAL 5-point rubber-insulated suspension.



8 International rear axles and transmissions are offered in hundreds of variations to provide the right capacity and proper final drive ratios for every hauling job . . . a matched combination that reduces road time and operating costs.



9 World's most complete line. There is an INTERNATIONAL “tailor-made” for every truck job, ½ tonners to 96,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own.

Experts get together at National Tank Truck Carriers meeting to discuss truck power. From left, they are G. P. Ransom (Power Development Section, General Motors Corp.), D. N. Frey (Engineering Research Office, Ford Motor Co.), E. C. Paige (Commercial Engine and Fleet Section, Ethyl Corp.), Bart Rawson (Editor, Commercial Car Journal), F. E. Selim (Philgas Motor Fuels Section, Phillips Petroleum Co.), W. D. Blizzard (Distribution, Cummins Engine Co.). Their views on what's doing are summarized here on the following two pages

What POWER for your Trucks?

By Donald N. Frey
Director, Engineering Research Office,
Ford Motor Co.

The turbine looks good as a future power plant for truck application because of four major reasons:

1. The turbine drives nicely. It is exceptionally smooth running and can do much to lower driver fatigue, especially on long runs.

2. Its lugging ability is the most favorable of any known power plant. The torque curve rises as the speed goes down and reaches a maximum at stall. It is reasonable to assume that transmissions can be greatly simplified or even eliminated altogether as the proficiency of the turbine is further increased.

3. All indications are that the turbine will have an extremely long life between overhaul periods. Experience on the Viscount Airplane operated by Capital Airlines indicates that the overhaul period is now twice that of a comparable piston engine.

4. The turbine has greater power per weight. The break even point now is approximately 150 hp when compared with the diesel and 200 hp when compared with gasoline engines. In any size above that point it is considerably lighter.

At Ford Motor Company we consider the turbine will be adaptable for any truck application above 10,000 lb GVW and it is my personal belief that its best application may come in about the 500 hp range pulling long distance tractor-trailer combinations of the future ranging between 90,000 and 100,000 lb GCW.

On fuel economy—the big headache up to now—we now have turbines that will compare with the diesel at full throttle and down to 10 per cent load. At idle it has at the moment a considerably higher fuel consumption. But we believe that fuel economy will not be a major factor one way or the other since it will be very closely comparable to the diesel throughout the entire range.

The big problem today is a matter of development and manufacturing. There is much engineering to be done before the truck turbine can go into production and I think this can best be summarized in the statement that initial cost is far too high for today's competitive market.

National Tank Truck Carriers' highly successful convention was staged at Detroit's Sheraton-Cadillac Hotel the last week in May. In addition to the "power" panel briefed in the accompanying article, members heard ICC Commissioner Robert Minor blast private carriers for resistance to registration with ICC . . . got a simultaneous bouquet and brickbat from ICC Safety Chief Ernie Cox (record good but should be better) . . . saw venerable Dan Dugan take the Trailmobile Award for "best contribution to the cause of highway safety" for the sixth time . . . had a bristling closed-session discussion on problems of their industry . . . and elected Frank L. Grimm of O'Boyle Tank Lines, Washington, D. C. as its new president.

By George P. Ransom
Power Development Section, General Motors Corp.

Fuel injection is, in effect, a carburetor for each cylinder of the engine. Each cylinder receives optimum fuel for a higher ratio of work for the fuel consumed.

The conventional engine with carburetor has spanned a period of more than 50 years. However the carburetor and manifold system has its limitation. The mixture does not always behave. In the quest for more uniform mixture to each of the cylinders, we can trace carburetor growth from a single venturi to a dual throat, from a dual throat to a four barrel and from a four barrel to a dual quad or eight barrel. But here we have reached the end of the rope.

There are advantages to the fuel injection system that it make its application to the truck engine even more enticing than in passenger cars. We can't have both the economy we would like and sparkling performance with a carbureted engine, but with fuel injection we can. Here are some of its advantages:

1. Even loading of the cylinders for better utilization of the fuel.

2. There is no need for an accelerator pump that dumps an additional shot of fuel with every stroke of the accelerator pedal.

3. Mixture can be leaner during cold starting and warm-up of the engine.

4. During deceleration the fuel may be cut off positively to effect a considerable fuel saving. This feature is particularly applicable to trucks, because the deceleration period is sustained longer by a heavier load.

5. An additional advantage to the fuel cut off feature is a greater engine braking effect than with carburetor engines. On down hill runs this feature would reflect in lower cost of brake maintenance.

6. With fuel injection for a given compression ratio, you can achieve the same power with a lower octane fuel. Obviously the octane rating of a fuel reflects directly in its cost.

As you know, the power of an engine is limited by its ability to pump air. With positive control of fuel distribution at the port or in the cylinder, the intake manifold becomes purely an air handling device. No longer do we need to compromise the design for fuel handling ability and restrict the breathing of the engine. We may even go beyond free breathing and construct the passages or legs of the manifold to provide "dynamic supercharging" and fill each cylinder to over 100 per cent of its normal volume.

This is a phenomenon caused by pressure waves which travel down the leg of the manifold much the same as the wave produced in a musical instrument. We would select the length of the leg exactly so that the pressure wave reaches the port just as the intake valve is closing, forcing a little additional air into the cylinder.

That is our case for fuel injection. Its inherent advantages are recognized and we think it is here to stay. In the beginning the price is necessarily a premium price. However, as tooling is established and volume increases, we foresee a price competitive with the carburetor system. The potential for economy and the ability to tailor the package to derive the desired engine characteristics make fuel injection very attractive.

Editor's note: There are several different types of fuel injection systems. For a description of the General Motors' type, with emphasis on the fuel control system, see page 104, this issue. The description and two unusually complete schematic diagrams were taken from another section of Mr. Ransom's paper.

Turn to next page, please ▶

What POWER for Your Trucks?

Continued from Page 67

By E. C. Paige
Head, Commercial Engine and Fleet Section, Ethyl Corp.

The conventional gasoline engine has come a long way and is far from dead. In searching for greater power and economy, it is imperative that we have not larger engines but ones that produce more power per cu in. of piston displacement at little or no increase in engine weight or reduction in payload. Here is a brief synopsis of conventional engine progress.

- A typical 1956 truck engine produces about 75 per cent more power per cubic inch than its counterpart in 1935. The specific figures are .266 hp per cubic inch in 1935 and .462 hp per cubic inch in 1956.
- Maximum horse power has increased an average of 65 per cent, from 98 in 1935 to 160 hp in 1956.
- Engine speed at maximum horse power has increased 31 per cent from 2550 rpm to 3330 rpm.
- Meanwhile average displacement has been reduced from 374 to 366 cu in.
- Average compression ratio for truck engines has increased from 4.8 in 1935 to 7.1 in 1956. This latter figure is approximately equal to that of the average passenger car in 1952. The discrepancy in the past several years has been due to the fact that many more passenger cars are being designed specifically for use of premium fuel which raises their average compression ratio disproportionately.

Of course, compression ratios are directly related to the anti-knock quality of the fuels available. The average premium grade fuel in 1935 was 78 research octane number and it is now 97. The same figures for the average regular fuel was 72 in 1935 and just under 90 today.

One of the major keys to future progress is the little understood fact that each additional octane number in the higher range is much more effective in permitting increases in compression ratio than similar increases at the lower octane number levels. For example increasing fuel anti-knock quality from 90 to 91 octane number will permit an increase in compression ratio exactly two times as great as would be permitted by increasing the anti-knock value from 75 to 76 octane numbers. Similarly raising the anti-knock value from 97 to 98 octane number will allow an increase in compression ratio three times as great as that permitted by a one octane number increase at the 75 octane level. The obvious inference is that we are now entering a period where gains in engine performance and fuel economy are particularly attractive when related to the anticipated increase in fuel anti-knock quality.

These potential gains are clearly indicated in the results of a test conducted with a special V-8 engine suitable for passenger cars and certain types of truck applications. The potential increase for both brake horse power and "brake specific fuel consumption" are shown in the following table:

	Per Cent Increase	
Comp. Ratio	Bhp	BSFC
6.0	—	—
8.0	12.0	10.2
10.0	19.7	15.4
12.0	27.1	21.9

At the 12 to 1 compression ratio, a fuel only slightly higher in anti-knock quality than that of current super-premium fuels would be required.

By W. D. Blizzard
Manager, Distribution, Cummins Engine Co.

The diesel has arrived. Immediately after World War II, one out of every 20 new trucks in the over 19,500-lb GVW class was diesel powered. By 1950, it was one in 10. Today, it is one in five.

Even at that rate of growth it will take the diesel a long time to predominate in the trucking field. However the area of greatest growth will be in the long distance intercity field where the economics justify the purchase of diesel power. For this type of service, or for such uses as dump truck operations where the vehicles log a lot of engine hours, there are three basic reasons which justify the use of the diesel.

First is lower fuel cost per mile. Diesel fuel now averages 1.5 cents per gal below that of gasoline and experience shows that diesels will produce a savings of 1½ to 3 cents per mile of operation.

But to justify the diesel, another factor has to be considered—the additional original cost. This aver-

ages between $2500 and $3000, or from $575 to $690 per year over a five year term.

To find out the number of miles to break even with diesel power, here are some break even points:

Initial Price Difference	Differential Per Year	Break-even mileages @ savings per mile			
		3¢	2½¢	2¢	1½¢
$2500	$575	19,200	23,000	28,700	38,300
$3000	$690	23,000	27,600	34,500	46,000

You can see that the widely accepted figures of a few years ago—60,000 to 80,000 miles a year—no longer hold. Today it is more like 35,000 to 40,000 miles. Now the diesels also compare much more favorably on size and weight.

Second reason is maintenance cost. In the formative years the diesel was somewhat higher in maintenance cost. But today with refinements in design, better fuel systems, and better parts availability, there is little difference. In fact the trend is going in favor of the diesel due to engine durability and improvement of maintenance techniques.

Third reason is greater vehicle availability. Gasoline engines require nearly 40 per cent more maintenance hours over four year life than do diesels (about 500 hours for diesels compared to over 700 for gasoline engines). Operators are finding that they can haul the same loads the same number of miles with 10 to 20 per cent fewer vehicles by switching to diesel due to the decrease in downtime.

What of the future?

Both the turbine and the free piston engine may be strong competitors at some future date. But as Dr. Frey points out, that day has not arrived. As for fuel injection for gasoline engines, we do not see it as a strong contender. And it should be remembered that the diesel was the original fuel injection engine.

The one change we do see in the near future is greater horsepower requirements brought about by the development of the new 41,000 mile interstate highway system. Many are predicting a "mainliner" truck combination hauling up to 96,000 lb at speeds of up to 70 mph. At zero grade this would require 375 hp and for a 3 per cent grade 910 hp. Assuming that 70 per cent of full engine speed is the most acceptable to provide maximum economy and durability we're predicting that the engine of the next decade for these mainliner vehicles will be in the range of 500 hp.

By F. E. Selim
Manager, Philgas Motor Fuels Section, Phillips Petroleum Co.

The LP gas engine can operate today at the lowest fuel cost of all in many parts of the country. Since the price of fuel varies considerably in different parts of the country, it is difficult to make any flat statements on the relative prices of gasoline, diesel fuel and LP Gas. However, there are some very significant trends in fuel prices which indicate that LP gas will generally maintain its favorable price differential to at least an equal and probably a greater degree than at present. The price, when coupled with known facts concerning supply and demand puts LP gas in a still more favorable light.

If the trends in fuel prices continue as they have in the past, and all our studies say they will, the areas in which LP gas has the advantage will increase in size and the differential in favor of LP gas will also continue to increase.

Here is a rule of thumb for comparing the price factors. Because of differences in heating values of the various fuels and in efficiencies of the engines in which they are used, there is a significant difference in the amount of fuel which the engines will use to do the same job. It takes more LP gas.

On the basis of mileage, experience tells us that LP gas is worth about two-thirds as much as diesel fuel and about 85 per cent as much as gasoline in heavy duty service. In other words, wherever the total cost of 100 gal of LP gas (including all taxes and fees) is equal to or less than the cost of 85 gal of gasoline or 66 2/3 gal of diesel fuel, the LP gas engine will be the logical power plant to use.

Of course there are many other items in total cost. I have plotted some of these differences in chart form rating each of the different type engines from (1) as most desirable to (4) as least desirable. This is the way the chart lines up:

Item	LP-Gas	Conventional Gasoline	Fuel Injection Gasoline	Diesel
Original Cost	3	1	2	4
Miles Before Overhaul	1	4	4	2
Cost Per Overhaul	1	1	2	4
Lube Oil Cost	1	2	2	4
Smoke & Odor	1	3	2	4
Fire Hazard	1	4	4	2
Weight/HP	1	2	2	4

You will note that the LP gas engine rates as most favorable except for original cost. You may be surprised at the fire rating but we have evidence to substantiate it including many case histories of rather violent crashes in which the safety devices prevented fires.

This is an editor's note: At this point Mr. Paige injected the thought that similar safety devices can be provided for gasoline engines "if we can get people to pay for them."

OIL ANALYSIS Guides Bus Service

Simple, quick tests give 2½ times previous oil mileage and spot engine

Viscosity tester is permanently mounted. It has slots in holder brackets so samples can be easily inserted

By Gustav E. Heiber
Vice President, Plant and Equipment
Boston, Worcester & New York Street Rwy. Co.

CRANKCASE OIL can tell you more about the condition of the engine than any other factor short of seeing inside. So we let the oil tell us what is actually happening.

We base inspections, oil changes, filter replacement and even major overhaul upon the results of a simple analysis of samples taken periodically from each coach crankcase. After nine years' experience with this method, we are agreed that crankcase oil analysis can save parts, save labor and catch impending breakdowns before serious damage is done.

Some of the indirect advantages of this type program might include savings in oil, improved fuel economy and more efficient engine operation, though each factor must be measured in terms of its application to the respective fleet.

We're saving money by using oil analyses. We're getting high engine mileage so we know that extending oil change periods has not endangered critical engine parts. We're saving hundreds of hours per month of shop inspection time, and our records show that road failures have been reduced appreciably since installing the program. I sincerely believe that any fleet could profit from investigating the subject.

We set up the program several years ago. At that time we were changing crankcase oil and filters every 8000 miles indiscriminately. All engines, regardless of make, age, or type of service, were getting the same treatment, though we knew well that these variations made changes too late in some, too early in others. We also realized that a simple oil change without a check up of the condition of the oil never solved any recurring problems in individual engines—never caught the troubles that made the oil change necessary. We

at B & W Lines

troubles before they happen

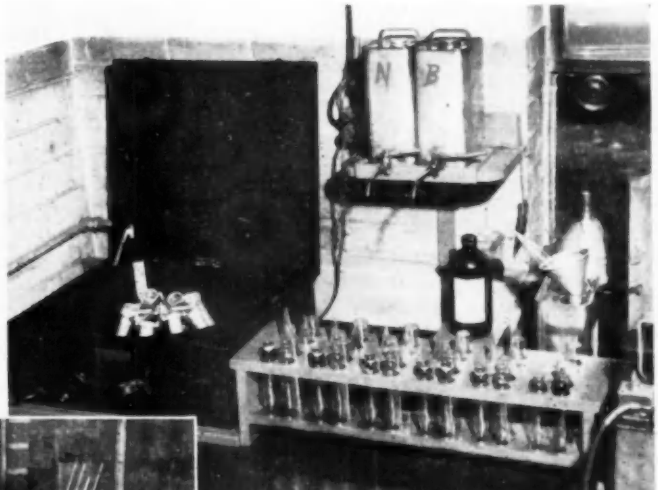
decided then that we had to find some way to treat the engines as individual units if we were to set up a realistic oil change program. The answer was the crankcase oil analysis program based upon the Gerrin testing equipment.

We chose this type equipment for several reasons. It is economical to use; it is relatively simple to perform; and it is quick with the answers. We know of other laboratory services, but reports could not be returned in time for the shop action that might be required.

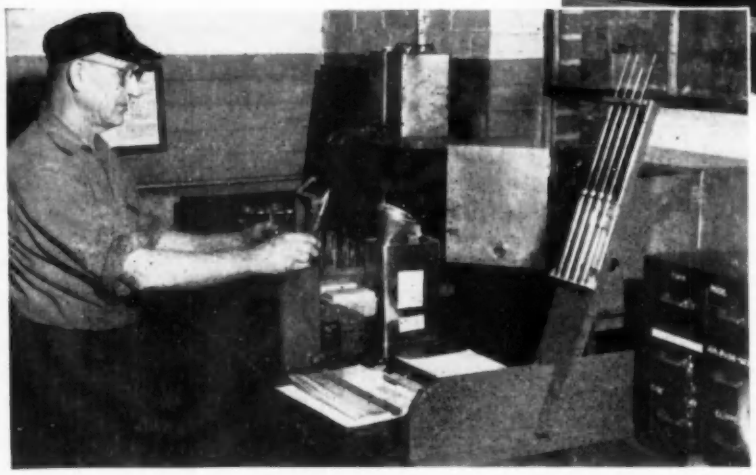
We felt that we could best handle the study right in our own shop, where samples could be analyzed in 20 minutes, and a report could be put into the hands of the shop foreman by the beginning of the working day—before the coach had moved

(TURN TO PAGE 116, PLEASE)

Shop-built containers for solvents used in the analysis consist of these handy one-gal cans equipped with petcocks and nozzles



Test tubes used in centrifuge are kept in this stand. It is drilled to take the tubes and sample graduates used in the analysis



Cleaning test tubes is easy with this jet unit. An electric fuel pump forces a stream from the container through the spray nozzle

Light duty electrical equipment won't stand up under high-speed, long-mileage truck service. So while it may mean a higher initial cost, it pays to . . .

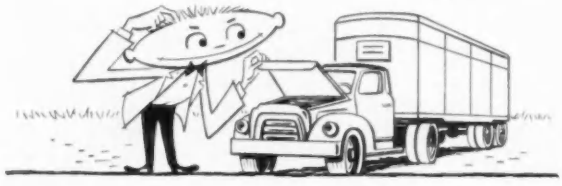
Choose Electrical Equipment

By H. L. Hartzell, Chief Engineer, Delco-Remy Corp., Anderson, Ind.*

TOO MANY TRUCKS are equipped with electrical equipment which was not designed for high-speed, long-mileage truck use. We estimate that at least two-thirds of the trucks engaged in this type of high-duty operation are using passenger car electrical equipment.

This equipment is designed to meet normal passenger car operating demands which, in terms of miles, sustained loads, operating temperature and vibration, are not in the same league with high-duty truck demands.

While such equipment has a lower initial cost, such savings are more than offset by downtime for



electrical maintenance. Electrical failures are second only to tires as a cause of road failures, and while the cost of electrical equipment constitutes only about six per cent of the total cost of a vehicle, it accounts for about 16 per cent of the vehicle's maintenance costs.

Truck manufacturers are aware of this situation, and they do offer higher duty equipment. Truck operators have been slow to accept this equipment however. Less than 10 per cent of trucks in the 5- to 10-ton GVW range use it and less than 80 per cent of the larger trucks use it.

It is difficult to describe electrical equipment accurately in terms of durability, since there is considerable variation in operating conditions. In the meantime, you are not getting gypped by truck manufacturers when they furnish you with passenger car electrical equipment, for that is the quality of equipment you have paid for.

Electrical equipment manufacturers know how to design the equipment needed for high-duty service. These items will be more rugged and will have considerably lower overall cost—that is, first cost plus maintenance and downtime costs. These manufacturers, I'm sure, are quite willing to make the better equipment if you truck operators will buy enough of it to support development and tooling costs. Electrical engineers responsible for truck equipment want to improve it. We are all having trouble determining proper application of the high duty equipment because of the lack of accurate maintenance cost data.

Let's consider some of the electrical components from the standpoint of durability in relation to operating demands. We will look at generators, batteries, starting motors, regulators and the ignition system to see what you should look for in selecting long-life equipment.

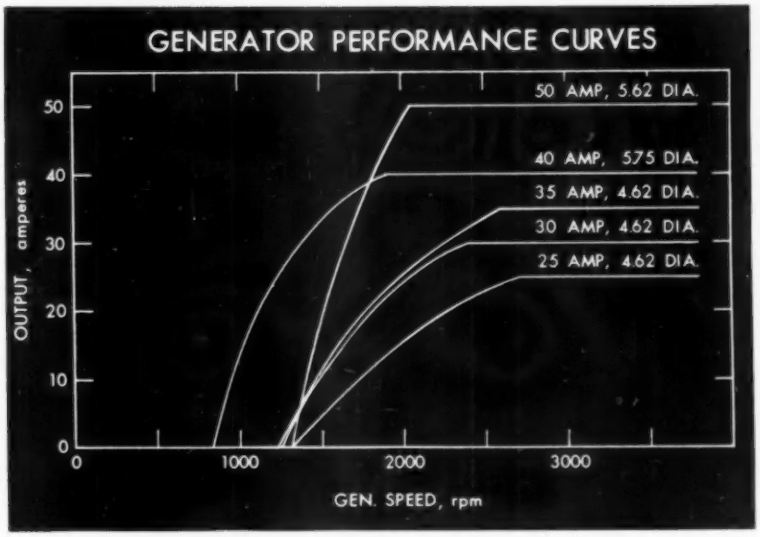
Choosing A Generator

In 1957, a popular, standard equipment truck generator is a 25-amp passenger car unit. As an alternative, truck manufacturers recommend generators with outputs of 30, 35, 40, and 50 amp outputs for intercity truck use.

The speed-output performance curves of the gen-

Based on the paper: "Electrical Equipment for High Duty Trucks" presented before a recent meeting of Michigan Trucking Assn.'s Maintenance Council.

Comparing speed-output of these generators shows the need for 50-amp unit for high-speed long-run trucks



that Lasts

erators we supply are compared in the graph on page 73. The 25, 30 and 35-amp generators are strictly passenger car types. The 40-amp units were designed primarily to provide a good charge at idle for vehicles operating mainly in the cities. By driving it at a much lower ratio to engine speed, it is a practical generator for intercity work. The 50-amp model was designed primarily for intercity applications and accordingly will provide the best service.

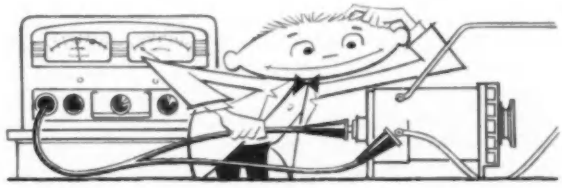
Which of these should you buy? Here are some measuring sticks: The generator must carry the full steady electrical load at highway cruising speeds, and in addition it should have enough reserve output to prevent battery rundown during city operation.

Here are some typical and some maximum loads based on 12-volt operation.

	LOADS IN AMPERES	
DAYTIME LOADS	TYPICAL	MAXIMUM
Battery Float	2.0	3.0
Ignition and gages	2.0	2.0
Heater and defroster	5.0	7.5
Windshield wiper	3.5	3.5
Broadcast radio	4.0	
Communication radio		7.0
	16.5	23.0
NIGHT-TIME LOADS (lighting added)		
Truck only	27.0	
Tractor and Trailer		41.5

You will notice that the night lighting load is 10.5 amp for a truck and 18.5 amp for a tractor-trailer combination.

The 25-amp generator is not adequate to handle the typical load. Even if the windshield wiper is not used the generator does not have enough output to recharge the battery after a luncheon stop with lights on, or after operating in the city. It is apparent that this generator could handle only loads of



mostly a daytime operation. Of course if the broadcast radio is not used and if the heater and defroster are used very infrequently, the 25-amp generator can satisfactorily supply the nigttime load.

Prevent Brush Failure

The other generators that are available will handle this typical load. However, there is a wide range in durability. The smaller generators do not give as much brush life at the same rating and, in addition, must be driven at higher speeds to obtain output to carry the typical load at low engine speeds. The usual drive ratio for the large generators is 1.25:1. For the smaller generator this may be increased to as much as 1.9:1.

The higher speeds will affect bearing life and, of course, will affect brush life very seriously. The combination of high load factor and high speed is rough on the smaller units.

(TURN TO NEXT PAGE, PLEASE)

Choose Electrical Equipment that Lasts

Continued from Page 73

The 30 and 35-amp generators operating steadily at the typical load and at their normal truck application speeds will give a brush life of 400 to 500 hours. The 35-amp generator operating at the typical load does not have any better brush life than the 30-amp generator. When operated at its full load, it has poorer brush life than the 30-amp unit when it is satisfactorily supply the nighttime load.

These 30 and 35-amp generators are sometimes confusedly classed as heavy duty units. They were designed primarily for the passenger cars that have higher electrical loads. Their brush life, bearing, life, and operating temperature are the same as for the 25-amp unit, and consequently they require the same frequent maintenance as the 25-amp unit.

The brush life of the 40-amp generator when carrying the typical load is around 2500 to 3000 hours and for the 50 amp unit the brush life is between 5000 and 6000 hours. The longer brush life and the longer bearing life of these latter two generators are typical of the gains that can be made by using truly heavy duty generators.

Because of shorter life for brushes, bearings, and insulation of the passenger car generator, the extra maintenance costs of these units in 100,000 miles operation are about twice the difference in the initial cost of these generators as compared to the 50-amp heavy-duty generator.

Tractors Need 50 Amp

When the tractor-trailer combination is used, even without the communication radio, there remains a 34-amp night load, and the 30- and 35-amp generators are inadequate for handling this load and should never be used. When the communication radio is used even the 40-amp generator is inadequate. In this case the 50-amp unit should be used.

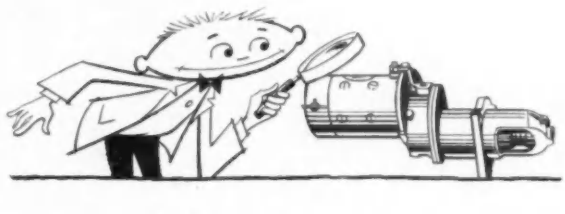
If the four-headlight system is used on trucks, the nighttime electrical loads with lights on high beam will increase about 4.0 amp over present loads. With this additional load the brush life of passenger-car-type generators will be appreciably shorter, and their outputs will become marginal. Again, if this new lighting system is used on tractor-trailer combinations, the higher electrical load will appreciably shorten the brush life of the present heavy duty generators. Design changes can be made to recover this loss.

For high duty truck service a ball bearing should be used at both ends of the generator, and supplementary lubrication should be provided. Wicks and reservoirs should be used to lengthen the time between lubrication periods. Any generator mounting problems that arise can be corrected by more attention to mounting details. Stiffer mounting supports and longer clamping bolts will greatly reduce mounting failures.

Starting Motors

The starting motor is subjected to more abuse on a truck than on a passenger car. Higher temperatures and more vibration due to the heavier loading of the engine are the main causes of abuse. Vibration, especially on diesel engine installations, often causes early failure of the drive and the shaft. High temperatures can cause solenoid operation failures.

As with generators, in the interest of low first cost, marginal motors, especially marginal batteries, are often used. This combination is likely to require



prolonged cranking to get the engine started because of low cranking speed. The longer cranking period will promote early failure of both the motor and the battery. This long period overheats the motor, burns insulation, wears out the brushes and dries out the bearing lubrication.

This next chart shows the range of motor performance needed to crank truck engines. The first two motors are currently being used on passenger cars. The third is a modification of a passenger car type. The fourth was designed strictly for the larger engines. The fifth and sixth motors have essentially the same type construction except that the fifth is connected for operation on 24 volts. Also shown are the engine sizes that these motors can handle.

MOTOR OUTPUT (hp)	ENGINE DISP. (cu in.) Gasoline	Diesel
1.2	265	
1.6	370	
2.1	500	
2.4	550	
3.9		426
7.4		743

These recommendations are in line with your desire to obtain trouble-free service. These motors are often used to crank larger engines than those indicated on this chart, and those are the installations that usually cause your maintenance problems.

Battery Selection

There is a wide variation in battery life in truck fleets. Some operators get 2½ to 3 years and others

get less than a year. Common causes of battery failure include oxidation of the positive grid, shedding of the positive plate, shedding of both plates, separator failures, seal failures and sulfation.

Positive grid life can be improved by precise control of the charging voltage. A voltage regulator suitable for truck use should be able to give that control.

The positive plate shedding problem is often the result of excessive cycling of the battery. This problem is worse where 12-volt passenger car batteries are used. These batteries have a smaller capacity with respect to the vehicle electrical load than those formerly used in the 6-volt system. Consequently the depth of cycling is greater for the 12-volt battery when it is furnishing the current for lights and other loads during stops. This problem can be solved by using a battery with more plate area. When cycling occurs due to city operation with frequent stops, a generator which charges at idle will give a good correction.

To prevent early failure due to excessive cycling I suggest that the ampere hour capacity of the battery should be at least three times the steady connected load. On that basis, trucks with the typical 27-amp load should have an 80-amp hr battery and the tractor-trailer with the 40-amp load should have a 120-amp hr battery.

Battery size should also be dependent on starting motor characteristics. This relation is discussed as part of the starting motor presentation further on.

When both plates shed quickly the cause is usually excessive vibration. Location and mounting arrangement should be given prime consideration. Studies with vibration pickups will enable the electrical engineers to demonstrate the gains that can be made. Battery design details can make the battery less vulnerable to vibration.

Rubber separators are a good investment. Well processed rubber separators will give good service well beyond the warranty period. They hold their shape, will not wear through, do not appreciably deteriorate in hot sulphuric acid, have high porosity and yet have small pores.

Seal failures can result from a poor mounting method, poor adhesion of the sealing material, poor temperature characteristics of the sealing material, loose plate assemblies and poor lead burning. Corrections for these failures are known and should be part of the battery specification.

Sulfation, as you know, is the result of the battery being in a partially discharged condition for long periods. This can be caused by an inadequate generator or a low regulator setting or both. The more nearly the generator carries the load under all operating conditions, the less exact the regulator setting has to be.

Next is the problem of battery size. After all, it is the battery that furnishes the power. In relation to starting motors, the plate area is far more important than ampere hour capacity. The ampere-hour rating is usually based on a discharge rate that depletes the battery in 20 hours. But then cranking the engine current draw ranges 50 to 75 times this value, and plate area is the main factor.

What Size Battery?

Referring to the table of the six starting motor sizes above, it can be stated as a general rule of thumb that the 1.2 hp unit needs a minimum of 9 plates in the battery. For 1.6 hp you will need 11 plates; for 2.1 hp, 15 plates; for 2.4 hp, 17 plates; for 3.9 hp, 27 plates, and for 7.4 hp, two 27 plate batteries.

When batteries with less plate area are used, the cranking speed and total accumulated cranking time before rundown would be less. Their performance is

adequate when the batteries are new and fully charged, but the trouble comes when they are partially discharged as is often the case after night operation. Then later, after the battery has acquired some age and has lost some capacity, night operation will cause further discharge, and the battery no longer has the ability to furnish the energy required to crank the engines fast enough for good starting. You then find it necessary to put in a fully charged battery and put the deficient one on the charging rack. This extra maintenance cost very soon eats up the initial savings made by using the small battery and, when the battery is inadequate, the prolonged cranking and fooling around trying to get the engine started will greatly shorten the life of the starting motor.

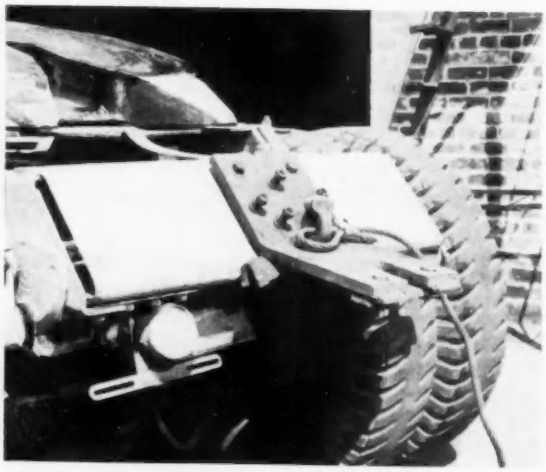
Better 12-Volt Systems

The larger diesel engines are usually equipped with 24-volt starting motors in order to get adequate cranking speed. Since it is doubtful if 24-volt lamps can be made to operate satisfactorily on a highway vehicle, it has been necessary to use the 12-24-volt systems on those trucks with the large diesel engines. The series parallel switch and the more complicated wiring of the 12-24-volt system has been a bad maintenance problem. Recognizing this situation, we have taken another look at how much we can improve the per-

(TURN TO PAGE 152, PLEASE)

1. Hoist

Blue Plate



2. Towing Bracket

YOUR FLEET is always on the look out for ideas and devices to increase the safety of over-the-road driving. Often this policy has resulted in our building new equipment ourselves. For example . . .

1.-2. Hoist and Towing Bracket

Any tractor in our fleet can be used to tow in a disabled unit. We made this small but rugged hoist to mount on the fifth wheel. When a tractor is to be used for towing, we block up the fifth wheel so that its surface is level. The base of the hoist, which contains a standard trailer pin, then easily slides into the notch in the fifth wheel.

Lifting power comes from the five-ton hydraulic jack which connects the base and a point one-third along the length of the boom. It provides a 2½-ton lift at the end of the boom. The lifting cable runs through a snatch-block hung from the end of the boom and provides a slow but sure five-ton lifting action.

The fixed end of the cable fastens to the bracket on the towing tractor's tailpiece, as shown in photograph No. 2. The bracket is held in place with seven bolts. The free end of the cable hooks under the bumper of the disabled tractor.

A Snug Hitch

The hydraulic jack is bolted down on a plate that is in turn welded over a sleeve. The bolt through this sleeve is welded at its ends to the hoist base. This permits the jack to rock on the bolt as it lifts. A similar sleeve is welded to the head of the jack. This holds a bolt that passes through ear pads welded to the boom. Thus the jack has play at the top also.

From the truck tailpiece the cable bracket extends back 12 in. It has a notch deep enough to receive the vertical center bar on the built-up bumper (see photo No. 3) of the disabled tractor. The heavy crosspiece of the bumper rests on the bracket. A flatbar is bolted across the notch behind the bumper bar to hold it in place. The bracket is made of one-inch steel.

A cable is run from the ends of the towing tractor tailpiece around the center of the towed tractor bumper. The bumper is also reinforced by cables run from the bottom rung back to the front axle. These are spaced about 18 in. from each end of the bumper.

Once the towed tractor is slung in position most

Every tractor in this fleet can be used as a tow truck when necessary, thanks to a shop-built tow unit. Here's how it's done, along with some other ideas

Designs for Towing . . .

By LeRoy Scheffer
● Fleet Supt., Blue Plate Foods, New Orleans, La.

of the strain is on the bracket and cables. Just enough remains to hold the hoist taut. The rig is mounted with a chain hoist at the garage, though two men can wrestle it on by hand if necessary. Once mounted it takes only one man to hoist and lash up the disabled truck.

3. Bumper Guards

We have a group of good, seasoned drivers who know how to stay out of accidents. But when serious accidents have happened, the fancy bumper guards shown here have saved us a lot of grief. The bumper is sturdy enough to withstand a glancing blow on one end. It is low enough to keep cars from plowing under, or to prevent the tractor from climbing a car and turning over. It directly protects the radiator grille, and as much as possible protects the fenders and lights.

On the new GMC diesels we've had to omit some of the upper bumper structures to let the wing pieces on the hood swing forward. Even so, we've had very little fender and light damage on the GMCs.

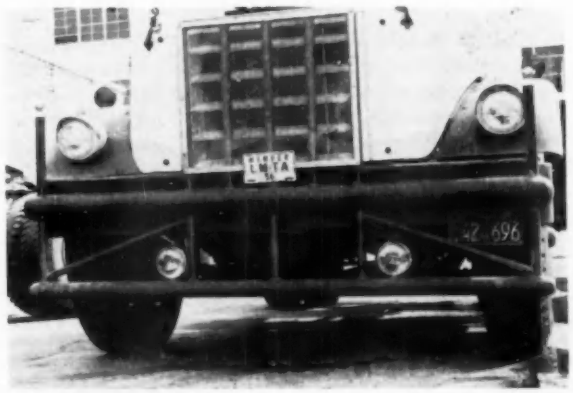
Less Headlight Damage

We use one, two, and four-inch heavy duty pipe throughout, with all welded joints. Two of the bottom struts have brackets welded at the back. These are flanged over and bolted to the underside of the tractor frame to stiffen the bottom rung of the bumper. On the diesels, because we couldn't surround the headlights with pipe, we capped the upright pipes with chrome plated knobs.

Savings in reduced headlight damage and fender dents alone have paid for making these bumpers. Also we've been able to hang fog lights closer to the ground where they are most effective. That's important in this bayou country.

(TURN TO PAGE 112, PLEASE)

3. Bumper Guards



4. Temporary Lights

ECONOMICS

Three experts show what you

The subject of diesel engines received a great deal of attention at the SAE Summer Meeting in Atlantic City last month. Diesels were described as the best power plants available for heavy-duty trucks. Engineers said that the new free piston engines and gas turbines eventually may offer some competition, but outstanding economy and performance of the diesel make it the preferred type for a long time to come. Improvements are coming. Among them are weight reduction and turbocharging. Engine bulk will also be decreased, engineers predicted. Meanwhile, present type diesel engines show some important economies as indicated by the reports from the meeting summarized here and on the following two pages.

NAIL "on-the-job tailoring produces economy"

FRANK NAIL, of Mack Trucks, Inc., reported on practical aspects of diesel operation. He said that the economics of truck operation can be predicted on a theoretical basis, but that actual results may be better or worse. Too many variables are involved, he said, which have a controlling effect on final performance. Maximum economy can be produced only by on-the-job tailoring of these principles:

1. Specific fuel consumption characteristics.
2. Horsepower weight ratio
3. Average speed
4. Seasonal effect
5. Gear ratios and terrain
6. Driving habits

Nail outlined laboratory and controlled tests made by Mack to determine basic factors affecting diesel operation. Then he presented actual results obtained in the field. Here are some of the results:

The 170 hp diesel, pulling a gross of 76,800 lb, when operated in southern California for the month of October, 1954, averaged 6.88 mpg for 3000 miles of operation. Half of this mileage was without payload. The tare weight was approximately 25,000 lb. (A 200 hp gasoline engine, operated by the same freight line, averaged 4.42 mpg. Three other chassis of the same fleet, with 200 hp diesels, averaged 4.69, 5.28 and 6.08 respectively.)

Continuing the tests this same 170-hp vehicle operated 9285 miles during the month of November, again one way loaded, at an average of 7.12 mpg. From December to April, 1955, 36,000 miles were covered, at an average of 6.75 mpg. During this period the freight lines started using this particular tractor for two way loads.

At this point the truck was taken out of service and the engine changed to the 205 hp, turbocharged version. After 20,900 miles of operation, the average was 5.56 mpg. A much greater proportion of the trips were loaded both ways during this period and the route had been shifted from the southern California rolling country to the famous "Ridge Route." Another factor had entered into the operation. The drivers were using the extra power to increase average speed. I quote from a report, "In one run, we cut one and one half hours off of the running time of the preceding day."

As a final check on this operation, fuel injectors were rechecked and serviced and for 6000 miles the average was 6.0 mpg.

To further illustrate the effect of drivers on fuel economy, a demonstration run with the 205 hp, turbocharged engine was operated in the eastern part of the United States, running between Tennessee and New York City. For 3500 miles the average fuel consumption was 6.46 mpg. On one of these runs, an accurate check was made between two terminal points. With one driver the mpg was 5.85, with the next driver the mpg was 7.1. There was no change in loading and the terrain over which the route was run was as nearly the same as is physically possible to find. The length of the run in both cases was approximately 300 miles. The gross weight was the legal limit in the state of Virginia of 52,500 lb.

In an operation in the New England area covering one month and crossing the Green Mountains, with loads varying between 48,000 and 52,500 GTW, mpg ranged from 5.6 to 8.6 with an average of 6.77 mpg.

AND DIESEL ENGINES

AN SAE REPORT

can do to up your fleet's miles-per-gallon fuel average

MILLER **"limit engine rpm and cruise speed"**

J. C. MILLER of Cummins Engine Co., Inc.—in discussing factors affecting fuel economy of diesel engines—outlined results of a series of tests made under actual operating conditions. He concluded that good economy can be obtained by limiting both engine revolutions per mile and "cruise speed." Low engine revolutions per mile can be obtained, he said, by using a high speed axle. Acceleration and hill climbing ability are affected, however, so careful consideration must be given to the overall performance expected.

Cooperation of the driver is required, Miller said, as it is almost always possible to drop down to a lower gear in the gear box for acceleration and so defeat the purpose of the high speed axle ratio. Cooperation is also required to limit the cruise speed since a high speed axle ratio combined with an engine which has more power than the minimum required makes it possible to run at a speed where fuel consumption is excessive. Cruise speed in this case is the road speed necessary to achieve the "average speed" and in most cases is the speed the driver likes to use.

Miller showed results of study of weight versus speed where data was taken from "shaft hp." This was taken by measuring the torque input to the rear axle with a torque meter, thus eliminating chance for errors or losses introduced by the engine fan, accessories, etc.

This test showed that at 40 mph an increase in GVW from 38,000 to 48,000 lb required an increase in shaft hp from 64 to 70. On the other hand, at the same 38,000 lb GVW, an increase in speed from 40 to 50 mph required an increase in shaft hp from 64 to 111. In these two examples, a 25 per cent increase in speed required 73 per cent increase in power, while a 26 per cent increase in weight only required a 10 per cent increase in power. Since speed requires such an increase in power, speed control appears to be a source to consider.

In considering the effect of speed on economy (mpg), a distinction must be made between "average speed," which is the terminal to terminal distance in miles divided by the hours it takes to get from terminal to terminal, and the "cruise speed," which is the road speed necessary to achieve the "average speed." In most cases, this is the speed that the truck driver likes to drive.

A cruise speed of 35 mph may be reached frequently in city traffic, but the time across town (average speed) may be painfully slow. On the other hand, a cruise speed of 35 mph on the open highway will net almost 35 miles in one hour of driving. Because of traffic delay, which is reasonably constant, the average speed does not increase in proportion as the cruise speed is increased. However, the power required goes up sharply as speed is increased. It is for this reason that limiting the speed is important if economy (mpg) is the goal.

At a cruise speed of 35 mph, the average speed was 31.4 mph, only 3.6 mph less. When the cruise speed was raised to 50 mph, the resulting average speed was 40.2 mph. An increase of 15 mph gave only 8.8 mph increase in average (terminal to terminal) speed. This is tabulated below with the corresponding fuel economy (mpg) for these runs.

Cruise Speed	Average Speed	Average as Per Cent of Cruise	MPG @ Cruise
30	27.8	93	8.2
35	31.4	90	8.0
40	34.8	87	7.66
45	37.8	84	6.25
50	40.2	80	6.80

In terms of economy increasing the cruise speed from 35 to 50 mph, and the resulting average from 31.4 to 40.2 mph, dropped the economy (mpg) from 8.0 to 6.8, a loss of 1.2 mpg. As a "rule of thumb," in this speed range, each mph increase in cruise speed drops the economy (mpg) by roughly 1/10 mpg, and each mph increase in average speed drops the economy (mpg) by roughly 1/7 mpg.

An increase in cruise speed to 15 mph from 35 to 50 mph only gave an increase in average speed (terminal to terminal) of 8.8 mph. To cruise at 50 mph with 48,000 GVW, 120 shaft hp was required, rather than the 50 required at 35 mph, or 140 per cent more. This is shaft horsepower. The engine horsepower and resulting fuel burned would be even more, because the engine fan, transmission, and accessory losses for the higher speed add up, too.

It has been generally accepted that wind and rolling resistance, and consequently fuel consumption, increase with speed, but

(TURN TO NEXT PAGE, PLEASE)

. . . and Diesel Engines

Continued from Page 79

the effect of engine speed has not been given much thought.

With a definite power required to drive a vehicle, the engine losses can be great or small, depending on how it is driven. No one would think of driving a passenger car in second gear all the time. The pick-up (acceleration) would be terrific and there would still be ample top speed for most traffic conditions, but there would be a big loss in fuel economy (mpg). The same thing applies to a truck. Low gear with high engine speed gives acceleration, but economy (mpg) suffers.

An engine runs on air as well as fuel, and it acts as its own air pump. If a great deal more air is pumped than is required for the power needed, extra fuel will be used just to pump air. Running an engine faster than necessary does just this. "Fanning the breeze" applies to engines, too. In addition, the fan, air compressor, and all other accessories take more power at the higher engine speeds.

For each power requirement, there is an optimum engine speed (rpm) for best fuel consumption (mpg). This is generally the lowest engine speed (rpm) at which position in traffic can be maintained.

To determine the potential economy (mpg) built into the engine and tractor, runs were made simulating level road, zero wind operation, with the effect of the driver and traffic eliminated by using fixed throttle settings. At 35 mph average speed, 11.2 mpg was obtained with 57,500 GVW with the 4.75 axle. This is the potential which is built into the rig, but practical considerations in normal operation preclude reaching this potential. However, we do have records of actual commercial trucking runs where the conditions approach the ideal, and the economy is better than 10 mpg.

Runs were also made where the engine was kept wound up to around 2500 rpm all the time by selecting the transmission gear which would keep the engine speed up. This is common practice with some drivers because of the performance (acceleration) which it gives. It is the equivalent of driving a passenger car in second gear all the time. As is to be expected, the economy (mpg) was poor.

Regardless of the average speed, only about 6 mpg was obtained, which demonstrates that wind and rolling resistance are smaller factors under these conditions than the engine losses due to poor driving practices. This points out another area where large gains in economy (mpg) are to be made.

Finally, runs were made under practical conditions, using the ordinary good driving practice of holding in the highest transmission ratio with which position in traffic could be held. At 35 mph average speed, 7.0 mpg was obtained with 57,500 GVW and the 4.75 axle. This economy (mpg) has been confirmed in a trucking operation where similar driving practices are followed by the regular truck company drivers.

Briefly, these tests and the curves from them show that at 35 mph about 11.2 mpg is built into the rig, but only about 6.15 mpg, or 55 per cent of this economy (mpg), is realized when the engine is kept wound up to 2500 rpm, which is a driving practice too frequently encountered. On the other hand, with good driving practice, 62½ per cent of the potential, or 7.0 mph, can be obtained.

To further explore the effect of engine speed (rpm), runs were made with the Kenworth tractor with both a 4.75 ratio rear axle and a 5.62 ratio axle. With the 4.75 ratio the top speed was 63 mph at 2500 rpm engine speed. With the 5.62 ratio the top speed was 54 mph. The 63 mph axle gives lower engine rpm and fewer "engine revolutions per mile." The 54 mph ratio gives better acceleration and hill climbing ability at the expense of higher engine rpm and revolutions per mile.

These tests also explain why economy (mpg) falls off in very hilly country, where it is necessary to keep the engine wound up to get the power required to maintain average speed over the hills. The total engine revolutions are also high in city driving where there is a great deal of gear shifting and running in gear to maintain position in traffic.

The effect of higher horsepower was investigated by increasing the power of the JT engine in the tractor from 165 to 200. Comparable runs were made with the 200 hp and the economy (mpg) measure. There was an increase in the average speed (terminal to terminal) at the expense of decreased economy (mpg) for this particular test course.

The optimum power is determined by the schedule and the terrain. Power in excess of that required to barely meet a schedule can result in wasted fuel from excessive road speed. On the other hand, with difficult terrain, more power may be used with no sacrifice in economy (mpg) but with large gains in time and availability of the equipment.

The higher horsepower does not necessarily give higher maximum speed because of axle ratio or legal limits, but it does give better accel-

(TURN TO PAGE 174, PLEASE)

SINKS "many avenues to fuel economy"

THERE ARE many avenues to improving the fuel economy of any diesel-powered unit, according to F. W. Sinks, Detroit Diesel Engine Division of GM. In his paper on matching of the engine to the application, he outlined some of the more important considerations.

1. Increased engine efficiency
2. Sound maintenance practices
3. Good fuels
4. Good operating habits of the unit operators
5. Increased power train efficiencies
6. Correct engine selection

There has been and currently is a great deal of effort being expended on all the items listed above. It is felt that, in many cases, appreciable economy gains could be made if more attention were placed on the correct engine selection or, more specifically, "matching the engine to the application."

A highway truck's fuel economy was improved from 6.5 to 10 per cent at 60,000 lb GCW to 30,000 lb GCW, respectively, without sacrifice in trip speeds (in one test). This improvement was accomplished without change in engine or power train efficiency but by gearing the vehicle so that, at the highway power requirements, the engine was operating at more efficient speeds.

In a crawler tractor installation that was tested recently, it was found that, for every 100 gallons of fuel that the engine converted into useful horsepower at the flywheel, only 50 gallons eventually went to do the job. Of course, every application has its own "parasitic" or power losses and, although this example may be a severe one, it can be used to emphasize the need for the equipment designer to use the utmost care in selection of accessories.

An examination of the difference between engine gross power and the power available for the job indicates three general areas of parasitic loss—(1) the losses due to the installed engine accessories and atmospheric conditions, (2) vehicle accessory power requirements, and (3) power train component losses.

Parasitic losses directly attributable to the engine as installed in an application include losses due to atmospheric conditions, intake restrictions, exhaust back pressures, and cooling fan power requirements. Intake air temperature, air intake system, and exhaust back pressure all tend to limit the amount of air available to the engine and thereby reduce the maximum power developed. The power loss due to this reduction of air varies with the engine rating, with those engines rated at a low air-to-fuel ratio suffering more than the engines rated at a high air-to-fuel ratio.

As an example, a 6-71 engine equipped with 70 MM3 injectors will lose approximately 1 per cent per 10° temperature rise and the same engine equipped with 60 MM3 injectors will lose about half that amount. Since all engines are sensitive to air intake temperature, the installation should be planned to give a minimum differential between ambient air and the engine intake air temperature.

Cooling fan horsepower is the largest of the engine parasitic losses and should, therefore, be considered most carefully for each installation. A good example of the importance of this part throttle consideration came to light during a truck economy test. A cooling fan change resulted in a savings of approximately 2 per cent of rated engine power, but produced a fuel savings during highway operation of 5 per cent.

The engine-chargeable parasitics may account for approximately 10 per cent of the gross engine power, particularly where no consideration is given to these parasitics.

Power train losses are those losses which are the result of transmitting the net engine power from the flywheel to the ground.

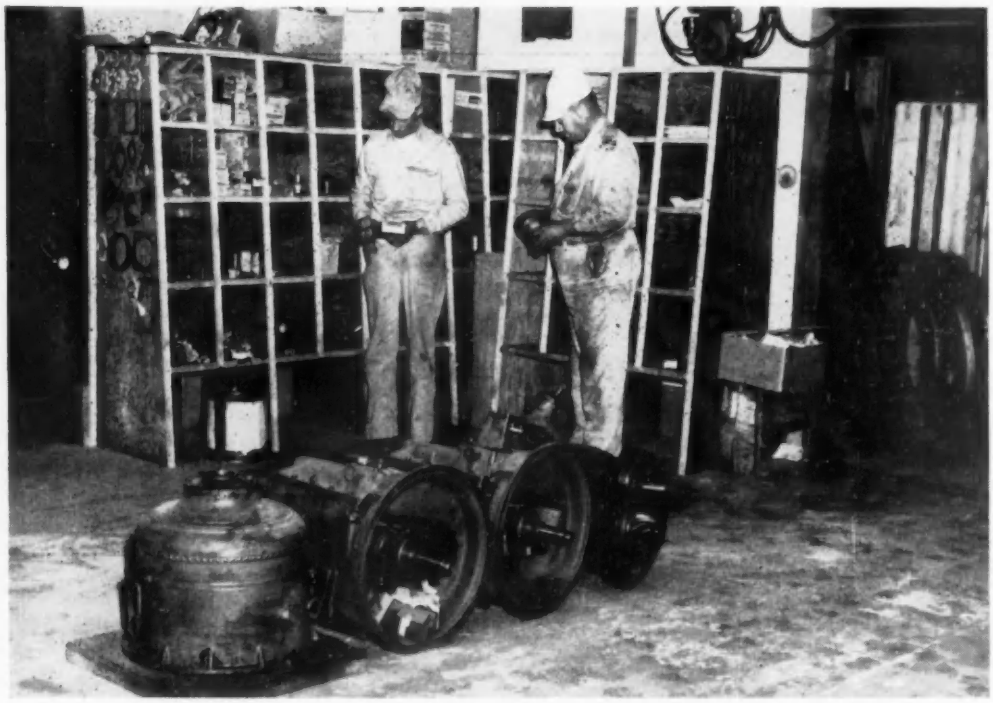
It is realized that any piece of equipment will have power losses; however, if these accessories are carefully chosen, the losses can be minimized and fuel economy and performance of the vehicle may be greatly improved.

Engine power requirements for any application vary widely and differ even further when the equipment owner's opinion is compared with the operator's. The owner is anxious to obtain the most work from his equipment for every gallon of fuel burned whereas the operator is anxious to out-perform all competition with small regard for the fuel he consumes.

The effect of engine power on highway truck performance and economy was studied during some controlled highway economy tests. During these tests, the engine power was varied by fuel input with the transmissions, axles, and parasitic losses remaining the same in all tests. If the truck were to be designed for any one of these engine power outputs, the power losses would vary, particularly the power loss of the engine cooling fan and the economy differences would become greater; however, to evaluate the effect of power alone, this was not done.

Power increase from 184 to 230 bhp (a 20 per cent increase) decreased fuel economy 9.5 per cent but increased highway trip speed only 6 per cent. The truck driver was very satisfied with the performance of the 230-hp vehicle and felt he had gained much more time over the test route than the stop watch showed. However, the trip speed increase did not make up for the fuel economy decrease and the net result to the truck owner was a higher operating cost. The speeds shown did not include time for loading, coffee stops, etc.; and, if these were taken into account, the increase in trip speed might well be minimized.

The effect of power on economy of any application will vary greatly, and each application must be studied from its particular load curve. To generalize, it might be stated that a unit must have sufficient power to allow the engine to operate at its designed conditions but not to have too much excess power so that the operator may "hot rod" and burn fuel with a minimum of overall work done.



Here's part of one of the parts rooms of Gillioz Construction Co. at the base shop at Monett, Mo. Centralized buying and parts control keep inventory costs down, parts ready in stock

Contractor's Base Shop Methods Reduce Inventory

CENTRALIZED PARTS buying in a base shop and parts depot, plus a supervising organization covering all contracts, saves thousands of dollars annually in time and reduced inventories for Gillioz Construction Co., Monett, Mo. Gillioz is one of the largest and oldest heavy construction contractors in the Middle West.

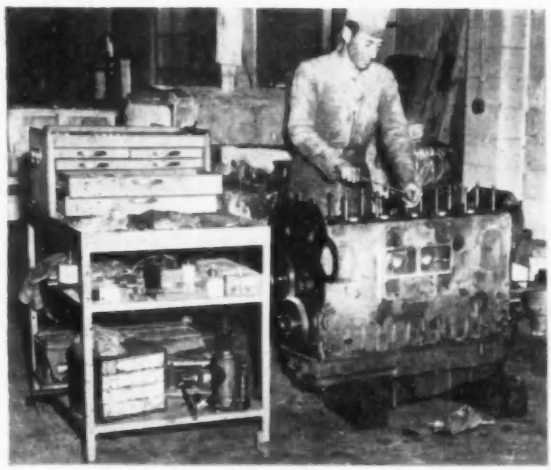
Gillioz has from five to 15 jobs going at the same time through the busy construction season each year. Most contracts are large excavation jobs and highway construction. If mechanics on each job ordered their repair parts direct, the consequent inventory would be excessive with wasteful duplication. Because of the trend in this direction without a central control of repairs, parts and maintenance, Gillioz established its base repair shop five years ago and set up a new system which has paid off in handsome dividends.

The main plan is for the base shop under the direction of Virgil Lilligard, equipment superintendent, to repair everything, salvage everything and control the parts inventory for all the jobs. He is aided by Richard Peck, shop foreman, and J. Jestice, welding superintendent.

Equipment Control

Each piece of equipment is entered on a card along with such information as cost, age, repair jobs, size, accessories. The card file covers more than 300 pieces of heavy construction equipment and is kept at the

Gillioz Construction Co. keeps its equipment on the job by frequent inspections in the field, complete records, unit replacements, and complete overhauls at its maintenance base



Gillioz handles complete overhauls at the base shop. This GMC diesel is getting new pistons, connecting rods and sleeves which were bought separately, matched and fitted

By L. H. Houck

Equipment superintendent Virgil Lillegard uses this panel truck to reach field contracts. It has an adequate supply of small parts and fittings needed for on-the-spot repairs

and Downtime

While sealed replacement units are used for most field repairs, for big jobs like power shovels it's sometimes necessary to handle the overhaul at the job location

general office at Monett, several blocks away from the base shop and equipment storage yard.

The construction equipment owned and operated by the company covers almost all types of heavy construction machinery. Major items of equipment include: 42 crawler tractors, 12 motor graders, 8 non-power scrapers, 10 air compressors, 8 off-highway trucks, 20 highway trucks (including pickups and panels), 2 mobile gravel plants, 6 cranes, 2 draglines, 2 power shovels, and 40 pieces of miscellaneous equipment such as pumps, pile drivers, light plants, etc.

When a new construction job is to be started, machinery is drawn from the equipment storage

(TURN TO NEXT PAGE, PLEASE)

Contractor's Base Shop Methods . . .

Continued from Page 83

yard, where it has been placed by the base shop after inspection and overhaul. Cards representing the assigned equipment are grouped against the files of that job. Subsequent changes in equipment are represented by changing the card. When a new piece of equipment is sent to the job, the card moves from the storage file to the job. When a unit is returned from the job to the shop, its card is moved into the division of shop and storage.

Field Maintenance

On an average road job, one mechanic and one or two oilers are assigned to handle the maintenance work. They are under the supervision of the project superintendent and Lillegard, who spends about half his time visiting the jobs and checking the maintenance.

Each mechanic makes a report each week with details of each job he has done. Each oiling crew makes a similar report in detail showing what they lubricated, quantities, and other pertinent information.

This method has been so developed that Lillegard can look at a weekly report, note the amount of oil, water or hydraulic fluid being used, and spot a coming repair job, an overhaul or an oil leak.

Unit Replacement

On larger jobs more mechanics may be assigned. A small field shop may be set up, but dismantling equipment and overhauls in the field are discouraged. Exchange of accessories with rebuilt accessories furnished by the base shop is encouraged as a means of getting the machine back on an efficient basis fast and eliminating expensive downtime.

Gilliez believes in appearance maintenance. Overhaul on this crawler tractor, like other units, included removal of all dents and a new paint job before final OK is given

All parts needed by equipment and ordered by mechanics in the field, regardless of how many jobs are under way, are sent to the base shop. Here the order is checked against existing stocks and frequency-of-use tables and a proper order made to keep inventory in line and yet have parts available when needed.

Reports of down machines and replacement needs also go to the general offices and base shop for action by whatever supervisory personnel is present. If the machine needs a complete overhaul, a rebuilt machine is sent out from the yard.

Starting system on this scraper's engine was converted from gasoline to electricity in the Gillioz shop. With the conversion, newer replacement engines may be installed

Overhaul As Needed

There is no emphasis on hours, elapsed time or mileage on any of the equipment as far as determining the ideal time for overhaul. According to Lillegard:

"The reason we don't overhaul and repair by the elapsed time method is that over the years we have found elapsed running time doesn't mean too much. One job will be easy and the next job will be a man and machine killer. Some 'impossible' jobs will put 10 years' wear on a piece of equipment in 10 days.

"We had a job not long ago in which the terrain was so rough that our rubber-tired dirt-moving scrapers operated in low gear so much that they burned off the mufflers.

"We can't change the job conditions, so we have to make our equipment do the job regardless of what

(TURN TO PAGE 126, PLEASE)

INSTRUMENTS— Modern Key to Engine Efficiency

Here's a guide to the right choice and use of instruments for your shop. It includes

COMPRESSION GAGE	VACUUM GAGE	AMMETER	DISTRIBUTOR TESTER
POWER TIMING LIGHT	ENGINE ANALYZER		CHASSIS DYNAMOMETER
VOLTMETER	REGULATOR TESTER	SPARK PLUG TESTER	COIL TESTER
FUEL PUMP TESTER	EXHAUST GAS ANALYZER		ENGINE DYNAMOMETER
CONDENSER TESTER	CAM ANGLE METER	TACHOMETER	OSCILLOSCOPE

By Paul A. Murphy, Technical Editor

WHERE AND ON the following pages, Commercial Car Journal presents a round-up discussion on shop instruments for engine tune-up and adjustment. You won't find all the equipment discussed "new." It would be surprising if you did. It would be equally surprising if you are familiar with all of the points raised. Hence we urge the article be considered as reference. Skip the parts that sound "old hat." Study the others . . . they well may be of real assistance.

More than 50 instrument makers have read the article, helped in its preparation. To them we are most grateful. On the final pages, you'll find a directory of these manufacturers. It lists, as far as possible, the instruments they make under the same headings as the article itself. All of them will be happy to supply further details.

● COMPRESSION GAGE

The compression test is usually the first and basic approach to diagnosing engine problems. Accurate compression readings will help locate most internal engine problems. It is one sure way to pin point a burned valve, a blown gasket, stuck or broken rings, by showing the mechanic which cylinder is below standard in compression.

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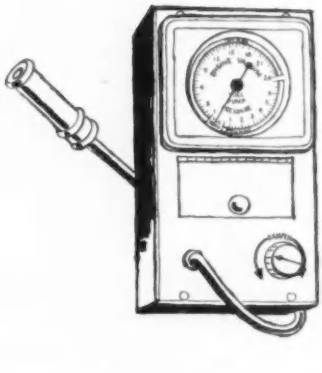
INSTRUMENTS—Modern Key to

From a practical standpoint, total cylinder pressure is not nearly as important as uniformity in cylinder readings. Should one cylinder show 25 to 40 lb below another cylinder, the engine will not perform satisfactorily.

Some mechanics have discontinued constant use of compression gages, simply because the gage they have will not do the job on late model engines, particularly the V-8's. Most compression gage manufacturers now offer several types of adapters to reach these difficult cylinders.

We have found some service personnel compromising with the gage readings. The mechanic may know his compression gage is reading low, but explains he's only using it for comparison tests anyway. But it seems to us they should be purchased and maintained as precision instruments.



● VACUUM GAGE

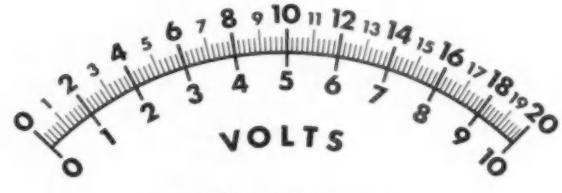
The vacuum gage is another worth-while unit in the hands of a skilled mechanic. Its use is tricky since many mechanical conditions produce the same effect. The vacuum gage is used chiefly as an aid in setting carburetor idle mixture and is most helpful in locating manifold conditions—such as burned out heat riser or intake manifold leaks.

It has also been helpful in diagnosing cam shaft problems, such as worn cam lobes. In the past we have found the vacuum gage is not a widely used instrument, but we feel we would not like to get along without one.

● AMMETER

Since the charge indicator light has appeared on a high percentage of instrument panels, the test ammeter has become a must for any mechanic. Although the ammeter is generally used with the charging circuit, it also has been helpful in determining the amount of current each electrical unit draws.

Suspected electrical defects can be successfully diagnosed with the use of an ammeter, particularly when the amperage draw exceeds the fuse or circuit breaker capacity. When the vehicle has a dash ammeter, the test ammeter should connect in series with it to check the accuracy of the dash unit. In most cases, the dash ammeter is not accurate enough to use as a guide in setting the current regulator.



● VOLTMETER

No serviceman should consider shooting trouble on a vehicle electrical circuit without a voltmeter. The wiring circuits are as important as the electrical units themselves.

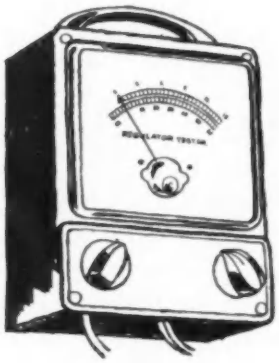
We have found that a generator and regulator may function well as individual units, but tied together with the vehicle wiring system they would not function properly, due to line resistance.

The voltmeter will show voltage loss at various points of the electrical system and aid the mechanic in finding the cause. Introduction of resistor units into the ignition system or generator-regulator system offers more use for the voltmeter. Particularly, this is true, now that some major manufacturers are going to constant voltage gage systems. Ford operates the fuel, oil and heat

Engine Efficiency

indicator gages on 5 volts. The voltmeter will measure the amount of drop across the resistor units.

Although primarily used in checking generator output, the voltmeter offers the mechanic a versatile tool capable of testing the complete vehicle wiring system.



● *REGULATOR TESTER*

The regulator tester is a must for every shop, often is the most used. It combines the voltmeter and ammeter with a resistor needed for checking charging circuits. Some shop personnel prefer the fixed resistor type that produces the same electrical condition as a fully charged battery. Others prefer the variable resistor type unit which compensates for battery deficiency.

Frankly this instrument has a tendency to scare mechanics who lack electrical know how, but it need not. While it is a good idea to assign regulator problems to specialists who are familiar with the equipment, if you send out to a specialty shop you lose the definite advantage of being able to observe other factors pertaining to the regulator function at the same time.

The voltage regulator should always be checked at operating temperature to insure an accurate setting. Caution: Battery wire should be disconnected before any wires at the generator or the voltage regulator are removed. This is to prevent loose connections from being grounded in such a way as to reverse generator polarity. This condition will cause arcing, fluttering and burning of the cut-out relay points. As a further precaution to insure correct generator polarity, it is a good idea to connect a jumper lead momentarily between the generator (heavy wire) and battery regulator terminals before starting the engine. (Note: Different connections on Ford). This momentary surge of battery current will polarize the generator correctly.

For service personnel not accustomed to working on charging circuits, always remember voltage equals "pressure," amperage equals "flow." You must remove a wire to check the flow (amperage), but pressure (voltage) may be checked at any point on the vehicle without disturbing the wire.

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Engine Testing Proves Instrument Value

In writing this instrument summary, I can't help but think back to the eight years I spent at the U. S. Government Aeronautical Engine Laboratory in Philadelphia. The lab's chief function was to run endurance tests on every type of aircraft engine used by the U. S. Navy. My job was in test cell activities. We tested everything from 4 to 28 cylinders and from 75 to 3000 hp.

Obviously testing unproven aircraft engines is far different from maintaining fleet equipment. Their peculiarities were unknown, their performance and stability yet to be checked out. In most cases, they were being run for the first time.

In the fleet shop it can be taken for granted that a distributor tester, for instance, includes specifications required for a particular engine. In the lab, such testing units were not readily available and the data still unknown. Valve settings for the fleet operator are specific and relatively simple. In the lab we had to try a number of different valve settings to establish the one that proved to be best.

Since virtually all fleet equipment has been tested in the lab and proven on the road, it is my firm opinion that the fleet operator should normally hold closely to factory recommendations. Of course, there have been cases where individuals have been able to modify factory recommendations to meet particular requirements. But they are the exception, not the rule.

One of our chief aids in trouble shooting at the lab was the use of precision instruments. With them we could measure, evaluate or condemn any component of the engine. These same instruments are available to you. Together with the mechanics ingenuity, they offer a scientific approach to mechanical and electrical problems. . . . Paul Murphy

INSTRUMENTS • • •

Continued from Page 87

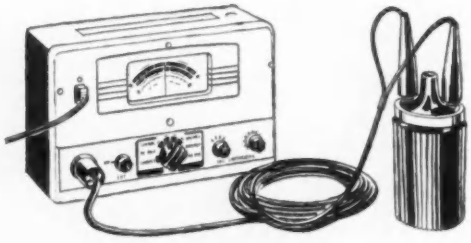
● SPARK PLUG TESTER

You can find out a good bit about what is going on inside the combustion chamber by looking at the old plugs. The color check will indicate whether the plug is too hot or too cold. Are there cracks, chips, blow-by marks indicating leakage at gasket? And there may be signs of oxidation and erosion of the electrodes. But a visual check won't tell when the plug is misfiring inside, or if a spark is jumping across the outside porcelain. That's where the pressure-type spark plug tester comes in.

The most widely used unit combines a tester and a cleaner. It compares the "sparking efficiency" of the used plug against that of a new plug of the same type and gap setting. This procedure eliminates such variables as voltage output of the tester or of the power source. For maximum accuracy, the used plug should be cleaned, sparking surface filed and gap reset.

One good thing to remember is that the spark plug cleaner should not be located near an area where engine or other component parts are torn down for overhaul. There is always the danger of the cleaning abrasive from the plug cleaner getting into the torn down assemblies.

Another hint for more efficient cleaning: Drain the old compound when it is reduced to a fine dust or is carbon contaminated. Old abrasive compound has a tendency to lose its cutting edges after prolonged use, therefore does not do an efficient job of cleaning. Also make sure the cleaning unit has a water tap on the air line, as a wet cleaning compound has a tendency to cling inside the plugs.



● COIL TESTER

Some mechanics in diagnosing ignition troubles, use the swap system. When a unit is in doubt, they swap it for another on a trial basis. This is particularly true when it comes to the coil. Comparison tests have been used successfully with two coils hooked-up together to compare the spark jump (air gap). This procedure is not always successful. The ability of the coil to throw a spark does not mean that the coil will function properly under all conditions.

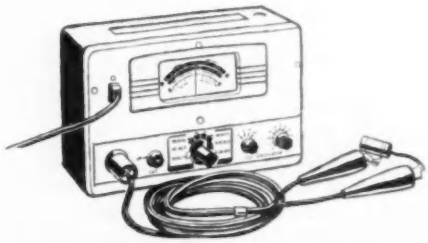
The sensible approach is to use a coil tester in relation to the other components with which it operates. Preferably it should measure both the electrical imput and the output of the coil.

High speed cut out, hard starting with hot engine, burned ignition contacts are problems that can be attributed to a faulty ignition coil. It is possible to have a coil in which some of the turns on the primary winding are shorted together. This produces an abnormally high amperage draw. It is also possible to have a poor primary connection in the coil and the amperage draw input would be lower than normal.

Furthermore, any coil can be designed for greater output if the input is also greater. Under some conditions a greater output is justified for high speed use or when compression pressures are abnormally high. All of these conditions point to the need for a good coil tester. With it you can check the unit and compare it with factory specifications.

Heater equipped testers are usually preferred. They offer a way of testing the coil under normal running conditions. On the other hand, some mechanics prefer to test the coil on the vehicle so as to duplicate actual conditions. Some testers have means of introducing a resistance in the primary input of the coil. This is to stimulate a reduced voltage under which the coil may be forced to operate on cold mornings when starter draw is excessive.

Several manufacturers are offering an "advanced" model coil tester, the so-called "ignition tester." In addition to checking the coil, it is capable of determining the high tension voltage and current delivered to the spark plug.

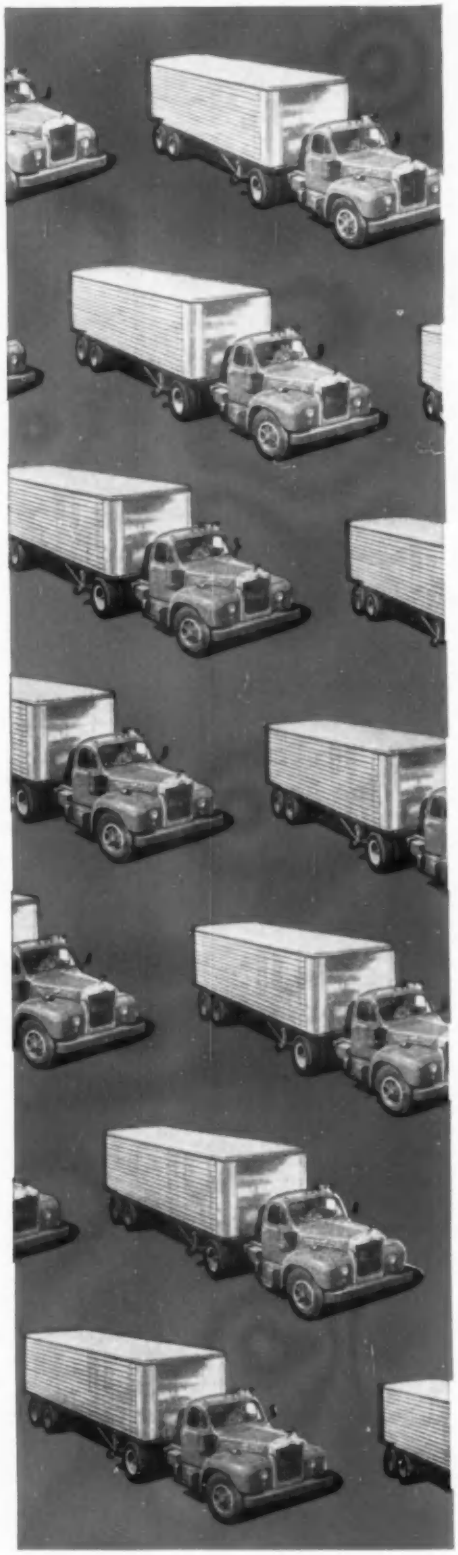


● CONDENSER TESTER

Although it is general practice to install a new condenser when new points are installed, it is not always necessary. This is where the condenser tester fits in. It should be capable of making the following tests—capacity, series resistance, leakage and direct short.

(TURN TO PAGE 90, PLEASE)

Macks SET THE PACE IN MAJOR FLEETS



. . . and here's how the owners put it!

"Macks feature top performance with unparalleled economy."
Jones Motor Co., Inc. ***176 Macks in action***

"In over 30 years' experience, we've found that for long distance hauling, Macks are the most dependable and economical truck we can buy."
Adley Express Co. ***343 Macks in action***

"We believe the Mack Thermodyne Diesel is superior to any other truck built. We've compared . . . and we find that Mack maintenance costs are lower, while Mack performance is higher."
Tower Lines, Inc. ***80 Macks in action***

"We appreciate the extra dependability of Macks on our toughest routes . . . back in the shop they require less maintenance, fewer hours of down time."
Eazor Express, Inc. ***90 Macks in action***

"Our new Macks run up the best records for economy and dependable service and the lowest maintenance costs that we have seen in our 23 years of over-the-road hauling."
Wilson Truck Company, Inc. ***250 Macks in action***

"Macks provide us with faster, more dependable service to our customers. Because of nearly constant speeds, they operate on faster schedules."
Dixie Highway Express, Inc. ***65 Macks in action***

"Nothing tops these new Macks in earning power . . . they're 'way ahead for fast, simple maintenance."
Akers Motor Lines, Inc. ***242 Macks in action***

"Macks mean greater profits for us. They team superior road performance with handling characteristics that enable us to work more efficiently in city traffic."
Strickland Transportation Co., Inc. ***48 Macks in action***

And there you have it—a few samples of what leading fleet operators have been saying in print over the past year. But why not get the Mack story first hand . . . from the Mack users nearest you. Hear what *they* have to say about the economy, dependability and long service life they get from their Macks. Your Mack dealer will be glad to make the introductions. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

5218

MACK
first name for
TRUCKS

INSTRUMENTS • • •

Continued from Page 88

But a good tester will tell you more than whether a condenser is good or bad. Proper condenser capacity is, at best, a compromise. For example, at low speed more current flows through the primary ignition circuit. A condenser of larger capacity would be an advantage. If your fleet operates the bulk of the time at low speed, then a decided saving in point life could be obtained by the use of a greater than normal capacity condenser.

● CAM ANGLE METER

The portable cam angle meter checks cam angle while the engine is running. It is especially helpful with the new type distributor that has a window in the side for making adjustments. By attaching the cam angle meter leads to the side of the distributor, the mechanic can set to factory specifications while the engine is running. Also he can check the effect of breaker plate or vacuum control movement on cam angle.

Caution: When attempting to change the point settings, it is just possible to get the Allen wrench against the primary lead (condenser wire) and receive a shock through the wrench. You can also ground out the engine by touching the wrench against the body of the distributor and the primary lead at the same time.

With this instrument the mechanic can determine two things—(1) total cam angle, and (2) the effect rpm has on cam angle. We have found that in the past we could set up a distributor as prescribed by the factory, but as the unit increased in rpm the cam angle changed considerably. This was due to a worn breaker plate bearing or worn distributor shaft bushings.

● DISTRIBUTOR TESTER

The use of the distributor tester is the only way the mechanic can fully observe all functions of a distributor assembly. With the aid of this tester, it is possible to set cam angle, check or correct centrifugal advance, test the vacuum control unit. In fact, the mechanic can observe every function of the distributor in action and compare it with service data.

One of the most important functions of a distributor tester is to show the mechanic what effect the centrifugal advance has on cam angle at various speeds, and how much the cam angle changes when the vacuum control is activated.

Basically the distributor has to function from idle speed, up to 12,000 sparks per minute to maintain turnpike speed. It not only has to supply spark to the plugs but has to allow enough coil saturation to build up ample current to the plugs at all speeds. Due to the sensitivity of today's engines, the mechanic should no longer depend entirely on feeler gage and visual inspection to service distributors.

Inaccessibility of V-8 distributors is another reason why every service man should be sure that the distributor is functioning perfectly before it is installed on the engine. The only way to be sure of all the functions of the distributor, is to test the unit off the vehicle on an accurate distributor tester.

Some mechanics make a practice of lifting off the distributor assembly and mounting it on the distributor tester without touching any component parts of the distributor assembly. By his method, they are able to determine if the distributor was at fault or not. In fact they have solved many electrical problems by testing the unit before it is torn down to be rebuilt.

I personally like the idea of letting a rebuilt unit run for some time on the tester before it is installed on the engine. As the unit is running the feather edge of the rubbing block wears away almost immediately. This can change the cam angle as much as three degrees in the first few minutes of operation. At this point the mechanic can readjust the cam angle and feel reasonably sure it will maintain this setting.

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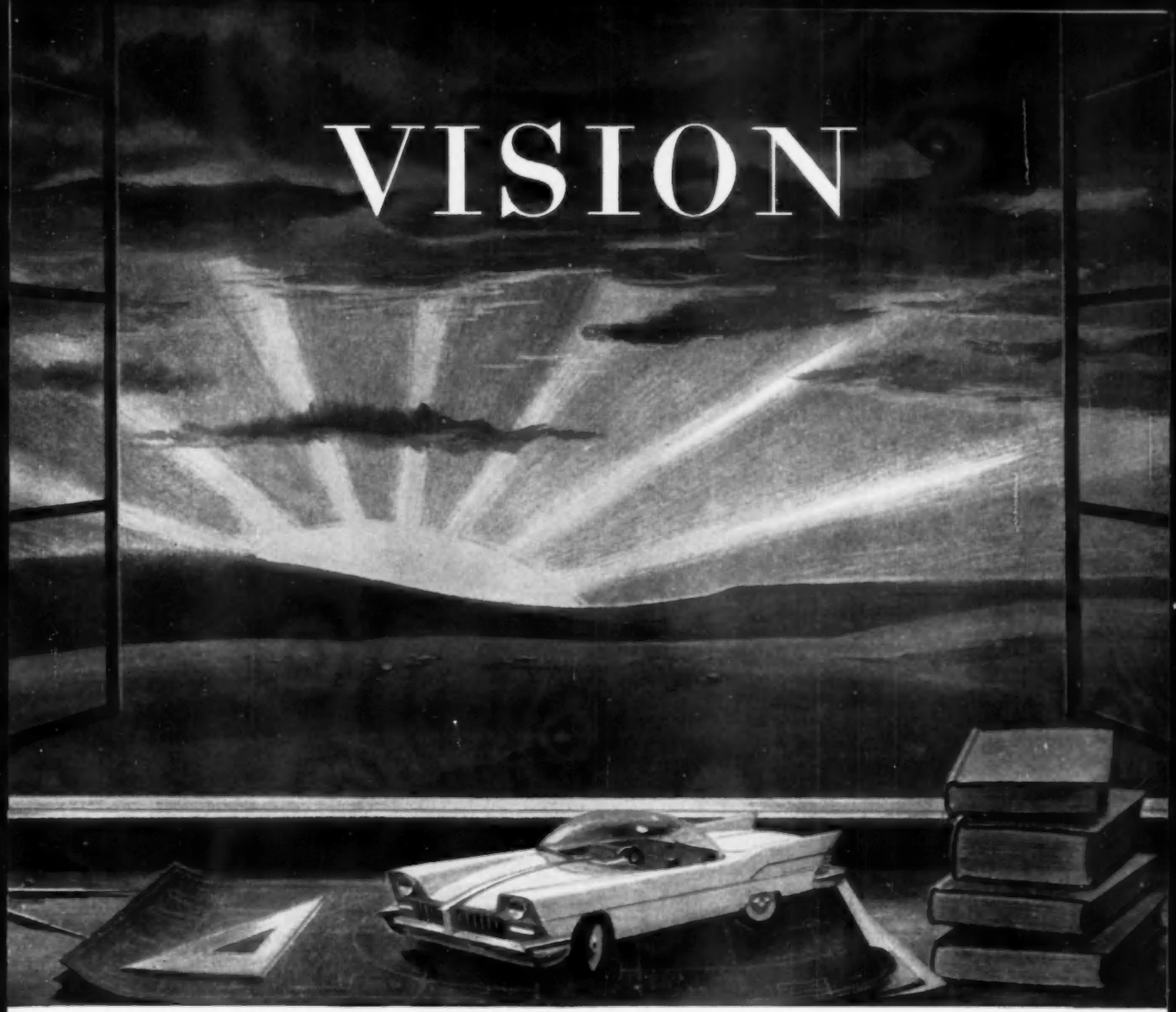


LOOKING TO THE FUTURE—PRODUCING FOR TODAY!

Progress has been the keynote of the automotive industry. Today's achievements are but challenges for the accomplishments of tomorrow.

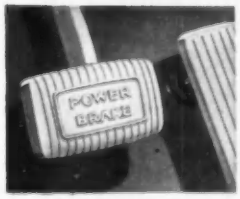
Over the years Bendix Products Division has contributed significantly to automotive progress. From four wheel brakes to power braking and power steering, Bendix has pioneered and developed many of the industry's most notable advancements.

And today Bendix Products Division is planning new and better products for the cars and trucks of tomorrow.

That's why the industry looks to Bendix* as a source of new ideas, as well as a volume manufacturer of automotive components.

*REG. U.S. PAT. OFF.

TYPICAL EXAMPLES



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Bendix Power Steering

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CONSTANT VELOCITY UNIVERSAL JOINTS • HYDRAULIC REMOTE CONTROLS

Bendix PRODUCTS DIVISION South Bend, IND.

Bendix AVIATION CORPORATION

INSTRUMENTS • • •

Continued from Page 90

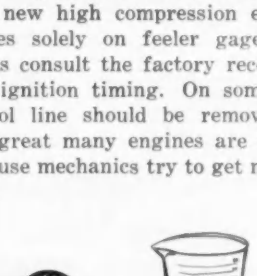
● POWER TIMING LIGHT

The timing light is an essential instrument for setting the ignition timing to the proper mark with the engine running. Proper use of timing light will eliminate guesswork, aid the mechanic to restore the engine to factory-recommended settings.

On older engines the "ping setting" worked out reasonably well. The mechanic could advance the timing until the engine "pinged," then back it off until the ping disappeared. On modern engines it is possible to over advance the initial timing 10 to 15 deg with no audible detonation or knock. That is why it is advisable to use a timing light rather than gamble on timing settings.

Vibration of distributor parts or wear in the drive chain should be watched for with the timing light while the engine is slowly run up to about 2000 rpm. If the timing mark flutters or fans out at any speed, it means that proper ignition timing is occurring only part of the time. If the flutter covers more than a three degree arc, it indicates that something is worn. The unit should be removed and overhauled.

Never install new points or adjust point spacing without rechecking ignition timing. This is especially important on new high compression engines if the mechanic relies solely on feeler gages for setting points. Always consult the factory recommendations, when setting ignition timing. On some engines the vacuum control line should be removed. We have found that a great many engines are definitely over advanced because mechanics try to get more power out of the engine.



● FUEL PUMP TESTER

Our experience shows that most mechanics when testing a fuel pump remove the fuel line at the carburetor, turn the engine over with the starter, and observe the fuel flow. This is not only dangerous, but it does not give a true picture of how the pump is functioning. Unrestricted flow from the end of the fuel line will give no indication as to how the pump will hold pressure.

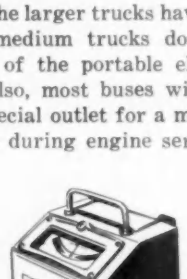
The fuel pump gage is the only accurate way to check the true condition of the fuel pump. Worn linkage, weak diaphragm spring, or leaky intake valve will show up in the inability of the pump to hold pressure. While it is safe to assume that most fuel pumps will give some warning before they quit altogether, it is good practice to check the fuel pump pressure at periodic intervals. Many fleets have installed auxiliary fittings on both intake and pressure side of the pump to facilitate these tests.

● TACHOMETER

The tachometer is becoming more and more essential due to high idle speeds, particularly in engines with overlapping cams. Furthermore, the speed at which automatic transmissions shift, generators cut in, automatic timing advances or engine governors cut in can all be determined with a tachometer.

Should an engine appear to have carburetor trouble at certain speed, the engine can be brought up to that speed. Then as adjustments are made, any increase or decrease in speed shows up accordingly on the tachometer. If the mechanic uses his ears and ingenuity only, he may or may not notice the change in engine performance.

While most of the larger trucks have built-in tachometers, small or medium trucks do not. Hence the going popularity of the portable electric tachometer has increased. Also, most buses with engines in the rear provide a special outlet for a mechanical tachometer for easy use during engine service.



● EXHAUST GAS ANALYZER

Exhaust gas analyzers (sometimes called fuel or combustion analyzers) measure the actual condition of the exhaust gases as they leave the vehicle. When

(TURN TO PAGE 94, PLEASE)

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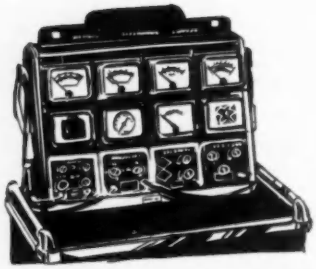
INSTRUMENTS . . .

Continued from Page 92

using this instrument, the engine should be warmed up to normal running temperature. Then always allow enough time for the instrument to accurately record mixture changes. For instance, when adjusting the idle circuit, be sure that enough exhaust gases have passed through the engine and finally through the instrument so that the corrected adjustment shows up on the analyzer. The combustion tester should not be used to set idle mixture, but rather to check the mixture during and after the adjustment.

One question always asked in connection with an exhaust gas analyzer is, "Are no-load combustion tests of any real value?" The answer is "Yes, no-load combustion readings are of very real value." The mixture may be different under load than at no-load but, if a carburetor performs properly at no-load, we can safely predict that it will function properly under all other conditions. After all, the same jets, air bleeds, venturis and float levels are involved under both conditions, therefore, the no-load and load mixture curves will have a direct relationship.

The power valve is one function of a carburetor that is not directly tested at no-load. However, the common troubles with power valves are almost entirely leaking and sticking open. Both these defects result in excessively rich mixtures on no-load tests and will therefore, be detected.



● ENGINE ANALYZER

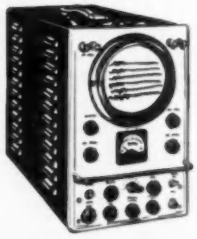
Most of the instruments discussed so far can be purchased in a combination unit officially known as an engine analyzer. But more often, they are better known by such nicknames as "box of brains," "Frankenstein" or "mechanical genius."

Under any name, these instruments are highly valued by the men who use them. Details vary a good bit between the various manufacturers, but most include a minimum of basic electrical instruments, plus exhaust gas analyzer, tachometer, fuel pump tester, etc.

These analyzers are portable, may be rolled from one job to another. Many provide separate removable units, combining related instrument groups such as voltmeter-ammeter, exhaust analyzer, etc. All have the great advantage of providing convenient storage space for most if not all the shop's instruments.

Biggest problem lies in the fact that many of these expensive units gather dust in an unused corner of the shop. Why? Here's an all-too-typical answer: "When we bought the unit, we had a man trained to use it. He is no longer with us, and nobody else has had enough interest to become familiar with it." This is a most unfortunate situation. But it happens a good many times.

True enough, the instruments do look complicated. But this is only because there are so many easy-to-use testers combined in a single unit. None of the units are more complicated than the individual units they contain. So the best advice we can offer is, "Train a man as soon as possible to make the best use of this valuable piece of equipment." Nearly all of the manufacturers maintain regular schools for this purpose, and many of them put the school on the road and can bring it right to your own community.



● OSCILLOSCOPE

The oscilloscope offers the definite advantage of showing on a screen an actual line picture of ignition firing as it happens. It translates electrical impulse into lines on the face of a TV tube. With it, the mechanic is able to check each cylinder individually or compare all in relation to each other. It gives an over-all picture of the ignition system under actual operating conditions, enables the mechanic to pinpoint troubles.

For example, we recently had some experience with a new V-8 engine. The driver reported a definite miss on occasion. Acting on the driver's complaint, the service department performed a complete engine tune-up that included removing the distributor assembly. Upon retesting, the engine still would miss on occasion. When the 'scope was brought in, it pinpointed the trouble in No. 5 ignition wire. When the wire was replaced, engine performance returned to normal.

Some mechanics are inclined to shy away from use of the oscilloscope. They erroneously believe it difficult to interpret and understand the wave patterns. True a little practice is needed, but, once the mechanic understands the basic pattern, the variations are quickly and accurately interpreted.

Further study is under way to increase the testing and troubleshooting capabilities of the oscilloscope. Various accessories are being made available, and

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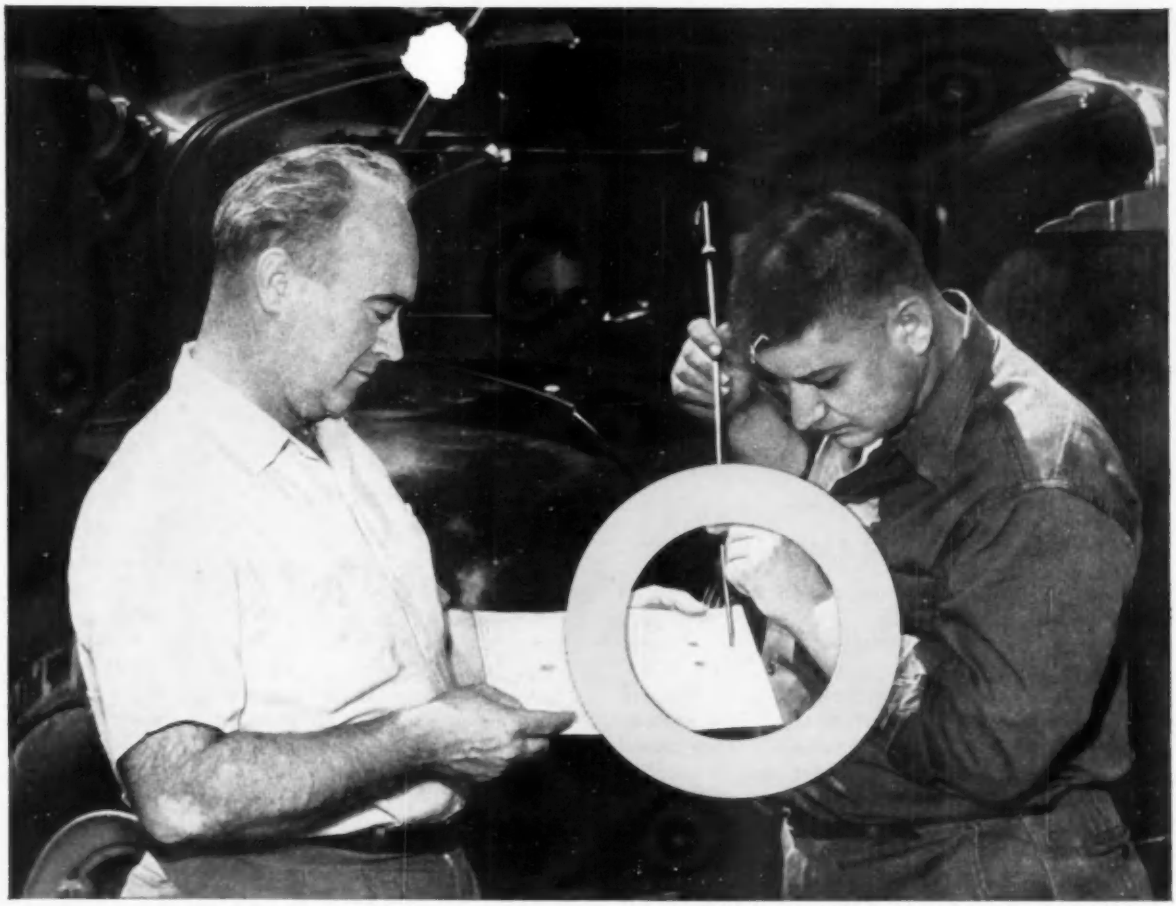
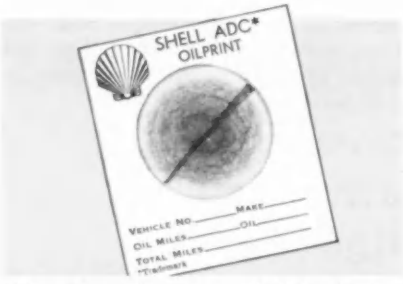


Mr. E. W. Rose and Mr. D. Sietzer of Midstates Freight Lines, performing an on-the-spot oil check of crankcase oil from a diesel tractor.

"The Shell ADC Oilprint Analysis benefits our fleet maintenance program"—

says E. W. Rose, Terminal Manager
Midstates Freight Lines, Clyde, Ohio



This card records visual proof of the oil condition for each vehicle.

An important saving! The Shell ADC* Oilprint Analysis enables this midwest transport company to gauge accurately just when each of its 246 big gasoline and diesel tractors needs an oil change. They save important money by not discarding still-good oil.

Just as important . . . Midstates finds that this new preventive maintenance tool gives them a quick check on motor conditions. They can spot such things as jacket leaks and cracked waterwalls in a few minutes. They can determine oil acidity and dispersancy . . . all by means of a spot test with just two drops of oil!

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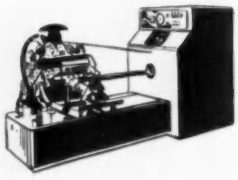
SHELL

INSTRUMENTS . . .

Continued from Page 94

the resulting wave patterns are being studied. For example, work is being carried on in the study of intake and exhaust manifold and valve problems, generator-regulator checking, engine vibration, gear noises, diesel injector timing and similar fields.



● ENGINE DYNAMOMETER

The engine dynamometer permits engine calibration under variable load conditions. Frequently it is used as a run-in stand for rebuilt engines. Breaking in engines under controlled load conditions seats rings, bearings, etc., for greater over-all engine life and better intitial oil and fuel consumption. Prebroken-in engines can be fully utilized immediately when placed in service. Any torque and speed can be applied against the engine when breaking it in under load. Also, power output of the engine can be checked before it is installed in the vehicle.

Mechanics often make a practice of setting up valves on the loose side and ignition timing on the late side so as to aid them in starting a tight engine. After the engine has been run-in on the dynamometer, final adjustments can be made more readily.

Many other engine malfunctions such as oil pressure, oil leaks, and engine knocks can be readily diagnosed on the test stand, and corrections made before the power unit is removed from the dynamometer. From a fleet standpoint the dynamometer offers a pretested engine ready to go, rather than just a rebuilt unit that may tie up the vehicle until some modifications are made. Together with an analyzer, the dynamometer can offer the fleet operator a complete engine laboratory capable of testing not only the bare engine but also all its accessories.

But operators frequently use the engine dynamometer for testing torque converters as well as engines. If you check engine output first, it's simple enough to get a reading on convertor performance. It's a practice that may help the truck operator, too, as automatic transmissions become more and more popular.

● CHASSIS DYNAMOMETER

Queen of all shop instruments is the chassis dynamometer. As a complete indoor proving ground, it offers the mechanic a more precise and faster way of testing a vehicle than he could ever expect from road testing, for on the dynamometer there are no road hazards or traffic congestion. "Hills" and loads are precise proportions. The check-out man or trouble-shooter can devote all his attention to the problem itself.

Single-handed, the dynamometer can check total performance of engine plus all drive line components. Coupled—as it usually is—with other instruments, it can show where or what the trouble is.

Many fleet operators have equipped their dynamometers with special fittings to accommodate quick installation of both standard and special instruments. One shop, for instance, has installed a carefully calibrated flow meter to give a direct reading in miles per gallon of fuel.

Finally, the dynamometer provides the perfect means of checking vague driver reports. "I've got a thump in the rear at 35 mph," says one of them. On a road test you can hear it too, but you can't get out of the cab to nail it down. With the indoor proving ground you can do just that.

Check this list to see who makes the instruments you need . . .

COMPRESSION, VACUUM GAGES

Acme Air Appliance Co., 100 Hinsdale St., Brooklyn 7, N. Y.
Allen Electric & Equipment Co., 2101 N. Pitcher St., Kalamazoo 13F, Mich.
Arsco Mfg. & Sales Corp., 451 Tenth Ave., New York 18, N. Y.
Auto-Test Inc., 600 S. Michigan Ave., Chicago 5, Ill.
Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8, Pa.
Bendix Products Division, Bendix Aviation Corp., 401 N. Bendix Drive, South Bend 20, Ind.
Electric Auto-Lite Co., Instrument Division, La Crosse, Wis
Electro Products Co., 445 E. 189th St., New York 58, N. Y.
A. R. Fisher Products Corp., 21-21 44th Drive, Long Island City 1, N. Y.
G. M. Mfg. Co., Inc., 13-08 43rd Ave., Long Island City, N. Y.
Gale-Hall Engineering, Inc., North Hampton, N. H.
F. T. Griswold Co., Lancaster Pike, Wayne, Pa.
Harvey E. Hanson Co., Lake Blvd. & Commercial St., Paw Paw, Mich.
Hastings Mfg. Co., N. Hanover St., Hastings, Mich.
Heyer Industries Inc., 471 Cortland St., Belleville 9, N. J.
Kennedy Service Tools Co., P. O. Box 38, Mogadore, Ohio
Kent-Moore Organization, Inc., 28635 Mound Rd., Warren, Mich.
King Electric Equipment Co., 9115 Inman Ave., Cleveland 5, Ohio
Mack Products Co., 15 Putnam St., Winthrop, Mass.
Miller Mfg. Co., 5919 Tireman Ave., Detroit 4, Mich.
Motoraide Corp., 2400 Emerald St., Philadelphia 25, Pa.
Nasa Tool Mfg. Corp., Locust Corner Road, Amelia, Ohio
National Machine & Tool Co., 4077 Page Ave., Jackson, Mich.
C. E. Niehoff & Co., 4925 W. Lawrence Ave., Chicago 30, Ill.
Petroleum Solvents Corp., 331 Madison Ave., New York 17, N. Y.
Republic Gage Co., 2220 Fenkell Ave., Detroit 21, Mich.
Rinck-McIlwaine, Inc., 16 Hudson St., New York 13, N. Y.

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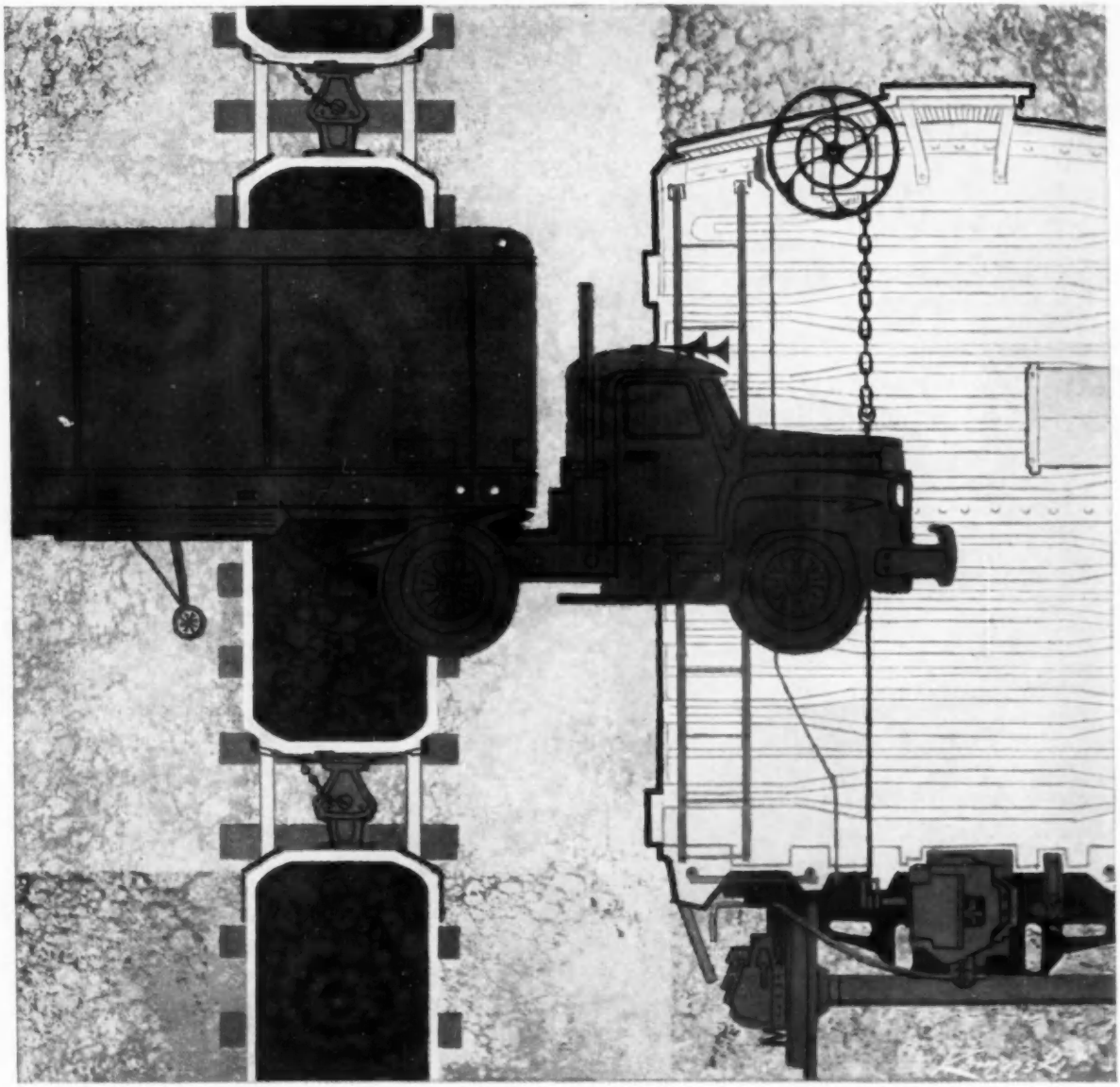

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INSTRUMENTS • • •

Continued from Page 96

Rochester Mfg. Co., 100 Rockwood St., Rochester 10, N. Y.
Schauer Mfg. Corp., 4500 Alpine Ave., Rossmoyne, Ohio
Snap-On Tools Corp., 8046 28th Ave., Kenosha, Wis.
Snow Plastics Corp., 5804 S. Oakley Ave., Chicago 36, Ill.
Stewart-Warner Corp., Instrument Division, Diversey Parkway, Chicago, Ill.
Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.
Syracuse Gauge Mfg. Corp., Manlius, N. Y.
United States Gauge Division, American Machine and Metals, Inc., Clymer Ave., Sellersville, Pa.
Wallace & Tiernan Inc., 25 Main St., Belleville 9, N. J.
Joseph Weidenhoff Inc., Box 220, Algona, Iowa
Westberg Mfg. Co., 144 S. Coombs St., Napa, Cal.

ELECTRICAL TESTING INSTRUMENTS (Regulator, Coil, Ignition, Condenser, Cam Angle Distributor, Tachometer, Ammeter, Voltmeter)

AC Spark Plug Division, General Motors Corp., 1300 N. Dort Highway, Flint 2, Mich.
Allen Electric & Equipment Co., 2101 N. Pitcher St., Kalamazoo 13F, Mich.
Arrow Armature Co., 15 Fordham Road, Boston 34, Mass.
Auto-Test Inc., 600 S. Michigan Ave., Chicago 5, Ill.
Berg-Gibson Mfg. Co., 817 E. 17th St., Kansas City 8, Mo.
Bristol Co., Waterbury 20, Conn.
Crumbliss Mfg. Co., 3830 N. Podlin Drive, Franklin Park, Ill.
Electric Auto-Lite Co., Instrument Division, La Crosse, Wis.
Electro Products Co., 445 E. 189th St., New York 58, N. Y.
Esterline-Angus Co., P. O. Box 596, Indianapolis 6, Ind.
General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.
General Electric Co., Apparatus Sales Division, 1 River Road, Schenectady 5, N. Y.
Harvey E. Hanson Co., Lake Blvd. & Commercial St., Paw Paw, Mich.
Heyer Industries Inc., 471 Cortland St., Belleville 9, N. J.
Hoyt Electrical Instrument Works, 42 Carleton St., Cambridge 42, Mass.
Ideal Industries, Inc., 1014 Park Ave., Sycamore, Ill.
International Products & Mfg. Co., 1452 S. Michigan Ave., Chicago 5, Ill.
Kal-Equip Co., P. O. Box 567, Kalamazoo, Mich.
Kem Mfg. Co., 20-21 Wagaraw Road, Fair Lawn, N. J.
Kennedy Service Tools Co., P. O. Box 38, Mogadore, Ohio
King Electric Equipment Co., 9115 Inman Ave., Cleveland 5, Ohio
King-Seeley Corp., 315 S. First St., Ann Arbor, Mich.
Machined Parts Corp., 6209 Hamilton Ave., Detroit 2, Mich.
Mack Products Co., 15 Putnam St., Winthrop, Mass.
Martindale Electric Co., 1340 Hird Ave., Cleveland 7, Ohio
Mercury Electric Corp., 719 Wyandotte St., Kansas City 6, Mo.
Motoraide Corp., 2400 Emerald St., Philadelphia 25, Pa.
C. E. Niehoff & Co., 4925 W. Lawrence Ave., Chicago 30, Ill.
Norton Electrical Instrument Co., 81 Hilliard St., Manchester, Conn.
Performance Measurements Co., 15301 McNichols Rd., Detroit 35, Mich.
Practical Devices Inc., 103 Lafayette St., New York 13, N. Y.
Rectifier Engineering Co., 1803 E. 7th St., Los Angeles 21, Cal.
Rochester Mfg. Co., 100 Rockwood St., Rochester 10, N. Y.
Schauer Mfg. Corp., 4500 Alpine Ave., Rossmoyne, Ohio
Shurhit Products Inc., 845 S. Market St., Waukegan, Ill.
Simpson Electric Co. 5208 W. Kinzie St., Chicago 44, Ill.
Snap-On Tools Corp. 8046 28th Ave., Kenosha, Wis.
Stewart-Warner Corp. Instrument Division, Diversey Parkway, Chicago, Ill.
Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.
T. & H. Mfg. Co., 811 E. 31st St., Kansas City 3, Mo.
Triple-A-Specialty Co. 2101 Walnut St., Chicago 12, Ill.
Turnsignal Corp., 2720 W. Susquehanna Ave., Philadelphia 22, Pa.
United States Gauge Division, American Machine & Metals, Inc., Clymer Ave., Sellersville, Pa.
Joseph Weidenhoff Inc., Box 220, Algona, Iowa
Wells Mfg. Co., 200 W. Division St., Fond du Lac, Wis.
Westberg Mfg. Co. 144 S. Coombs St., Napa, Cal.
Westinghouse Electric Corp., 3 Gateway Center, Pittsburgh 30, Pa.
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J.
K. R. Wilson Inc., Arcade, N. Y.
Frank N. Wood Co., 344 W. Main St., Waukesha, Wis.

SPARK PLUG TESTERS

Acme Electric Corp., Cuba, N. Y.
AC Spark Plug Division, General Motors Corp., 1300 N. Dort Highway, Flint 2, Mich.
BG Corp., 321 Broad Avenue, Ridgefield, N. J.
Bowes "Seal Fast" Corp., 228 N. Pine St., Indianapolis 7, Ind.
Champion Spark Plug Co., 900 Upton Ave., Toledo, Ohio
Cropley Instruments, 10 S. River St., Aurora, Ill.
Globe-Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis.
Kastar, Inc., 200 Lincoln Ave., New York 54, N. Y.
King Electric Equipment Co., 9115 Inman Ave., Cleveland 5, Ohio
L. B. Miller Co., 394 State St., Stamford, Conn.
Rinck-McIlwaine, Inc., 16 Hudson St., New York 13, N. Y.
Edmund J. Wudel Mfg. Co., 6082 Ferguson Drive, Los Angeles 22, Cal.

POWER TIMING LIGHTS

Advertising Distributors, Inc., 5046 Shaw Avenue, St. Louis 10, Mo.
Allen Electric & Equipment Co., 2101 N. Pitcher St., Kalamazoo 13F, Mich.
Arsco Mfg. & Sales Corp., 451 Tenth Ave., New York 18, N. Y.
Auto-Test Inc., 600 S. Michigan Ave., Chicago 5, Ill.
Gale-Dorothea Mechanisms Inc., 39-39 63rd St., Woodside, Long Island, N. Y.
E. Edelmann & Co., 2332 Logan Blvd., Chicago 47, Ill.
Harvey E. Hanson Co., Lake Blvd. & Commercial St., Paw Paw, Mich.
Heyer Industries, Inc., 471 Cortland St., Belleville 9, N. J.
Kal-Equip Co., P. O. Box 567, Kalamazoo, Mich.
King Electric Equipment Co., 9115 Inman Ave., Cleveland 5, Ohio
Nasa Tool Mfg. Corp., Locust Corner Road, Amelia, Ohio
National Machine & Tool Co., 4077 Page Ave., Jackson, Mich.
C. E. Niehoff & Co., 4925 W. Lawrence Ave., Chicago 30, Ill.
Petroleum Solvents Corp., 331 Madison Ave., New York 17, N. Y.
Save Lamp Co., 3687 Ash St., Baltimore 11, Md.
Schauer Mfg. Corp., 4500 Alpine Ave., Rossmoyne, Ohio
Sittler Corp., 18 N. Ada St., Chicago 7, Ill.
Snap-On Tools Corp., 8046 28th Ave., Kenosha, Wis.
Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.
T. & H. Mfg. Co., 811 E. 31st St., Kansas City 3, Mo.
Tippett Timer, 5822 Helen St., Jennings 21, Mo.
Tungsten Contact Mfg. Co., 7311 Cottage Ave., North Bergen, N. J.
Tungsten Mfg. Co., 1923 E. 79th St., Chicago 49, Ill.
Joseph Weidenhoff Inc., Box 220, Algona, Iowa

FUEL PUMP TESTERS

AC Spark Plug Division, General Motors Corp., 1300 N. Dort Highway, Flint 2, Mich.
Airtex Products Inc., Airtex Automotive Division, Fairfield, Ill.
Allen Electric & Equipment Co., 2101 N. Pitcher St., Kalamazoo 13F, Mich.
Arsco Mfg. & Sales Corp., 451 Tenth Ave., New York 18, N. Y.
Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8, Pa.
Gale-Hall Engineering, Inc., North Hampton, N. H.
Harvey E. Hanson Co., Lake Blvd. & Commercial St., Paw Paw, Mich.
Heyer Industries Inc., 471 Cortland St., Belleville 9, N. J.
Hygrade Products Co., 35-35 35th St. Long Island City, N. Y.
Kem Mfg. Co., 20-21 Wagaraw Road, Fair Lawn, N. J.
King Electric Equipment Co., 9115 Inman Ave., Cleveland 5, Ohio
Motoraide Corp., 2400 Emerald St., Philadelphia 25, Pa.
Rinck-McIlwaine, Inc., 16 Hudson St., New York 13, N. Y.
Schauer Mfg. Corp., 4500 Alpine Ave., Rossmoyne, Ohio
Snap-On Tools Corp., 8046 28th Ave., Kenosha, Wis.
Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.
Joseph Weidenhoff Inc., Box 220, Algona, Iowa

EXHAUST GAS ANALYZERS

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Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8, Pa.
Cambridge Instrument Co., 3606 Grand Central Terminal Bldg., New York 17, N. Y.
Choldum Mfg. Corp., 331 East St., New Haven, Conn.
Electro Products Co., 445 E. 189th St., New York 58, N. Y.
Charles Engelhard, Inc., 900 Passaic Ave., East Newark, N. J.
Gale-Hall Engineering, Inc., North Hampton, N. H.
Gow-Mac Instrument Co., 100 Kings Road, Madison, N. J.
Harvey E. Hanson Co., Lake Blvd. & Commercial St., Paw Paw, Mich.
Heyer Industries Inc., 471 Cortland St., Belleville 9, N. J.
King Electric Equipment Co., 9115 Inman Ave., Cleveland 5, Ohio
Motoraide Corp., 2400 Emerald St., Philadelphia 25, Pa.
George L. Nankervis Co., 15300 Fullerton St., Detroit 21, Mich.
Permutit Co., 330 W. 42nd St., New York 36, N. Y.
Schauer Mfg. Corp., 4500 Alpine Ave., Rossmoyne, Ohio
Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.
Joseph Weidenhoff Inc., Box 220, Algona, Iowa

ENGINE ANALYZERS

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Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8, Pa.
Binghams-Herbrand Corp., Herbrand Division, Lake & Stone Sts., Fremont, Ohio
Electro Products Co., 445 E. 189th St., New York 58, N. Y.
Gale-Hall Engineering, Inc., North Hampton, N. H.
Harvey E. Hanson Co., Lake Blvd. & Commercial St., Paw Paw, Mich.
Heyer Industries Inc., 471 Cortland St., Belleville 9, N. J.
Hygrade Products Co., 35-35 35th St., Long Island City, N. Y.
King Electric Equipment Co., 9115 Inman Ave., Cleveland 5, Ohio
Mack Products Co., 15 Putnam St., Winthrop, Mass.
Mercury Electric Corp., 719 Wyandotte St., Kansas City 6, Mo.
Motoraide Corp., 2400 Emerald St., Philadelphia 25, Pa.
George L. Nankervis Co., 15300 Fullerton St., Detroit 21, Mich.
Rinck-McIlwaine, Inc., 16 Hudson St., New York 13, N. Y.
Shurhit Products Inc., 845 S Market St., Waukegan, Ill.
Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.
T. & H. Mfg. Co., 811 E. 31st St., Kansas City 3, Mo.
Joseph Weidenhoff Inc., Box 220, Algona, Iowa
Westberg Mfg. Co., 144 S. Coombs St., Napa, Cal.
K. R. Wilson Inc., Arcade, N. Y.

OSCILLOSCOPES

Allen B. Du Mont Laboratories Inc., 750 Bloomfield Ave., Clifton, N. J.
Heyer Industries Inc., 471 Cortland St., Belleville 9, N. J.
Sun Electric Corp., 6323 Avondale Ave., Chicago 31, Ill.
Joseph Weidenhoff Inc., Box 220, Algona, Iowa

DYNAMOMETERS

Clayborne Mfg. Co., 429 N. Main St., Monticello, Ind.
Clayton Mfg. Co., 401 N. Temple City Blvd., El Monte, Cal.
Eaton Mfg. Co., Dynamatic Division, 3307 14th Ave., Kenosha, Wis.
General Electric Co., Apparatus Sales Division, 1 River Road, Schenectady 5, N. Y.
Heath Company, Benton Harbor, Mich.
Link Engineering Co., 13845 Elmira Ave., Detroit 27, Mich.
Mid-West Dynamometer & Engineering Co., 3100 River Road, River Grove, Ill.
George L. Nankervis Co., 15300 Fullerton St., Detroit 21, Mich.
Taylor Dynamometer & Machine Co., 6411 River Parkway, Milwaukee 13, Wis.
Toledo Scale Co., Telegraph Road, Toledo 1, Ohio
Westinghouse Electric Corp., 3 Gateway Center, Pittsburgh 30, Pa.

HOW BELL SYSTEM COMMUNICATIONS SERVE THE TRUCKING INDUSTRY

Teletypewriter control room in Terre Haute co-ordinates all Eastern Express shipments.

"Fast communications are vital to good customer relations"

—Welby M. Frantz, executive vice president, Eastern Express, Inc.

"To handle a $20-million-a-year volume among 19 terminals, we need good communications," says Welby M. Frantz, executive vice president of Eastern Express.

"Bell System private line service keeps us—and our customers—in the driver's seat on every shipment. This continuous contact pays off in maximum truck utilization, efficient dock operation—and a steadily growing business."

Here's how Eastern uses Bell System service:

Private line teletypewriter: operational truck reports are sent every three hours by each terminal to area control centers in Terre Haute, Ind., and Bedford, Pa. Speed of transmission and the written record provided enable Eastern to pre-plan dock loading. Scheduling and tracing are also accomplished on a much faster, more efficient basis.

Private line telephone: All terminals keep in touch by voice, plan shipments to save days for customers. Less-than-trailerload consignments can be redirected according to destination so that every trailer leaves every Eastern terminal with a full pay load.

• • •

A Bell System representative will gladly show you how streamlined communications can mean a more profitable operation. Just call your Bell Telephone Company business office.

BELL TELEPHONE SYSTEM

PRIVATE LINE TELEPHONE • PRIVATE LINE TELETYPEWRITER • DATA TRANSMISSION SYSTEMS
CHANNELS FOR: REMOTE METERING AND CONTROL • TELEPHOTOGRAPH • CLOSED CIRCUIT TV

IHC's Select-O-Matic Transmission

Features Hydraulic Clutch

Detroit Technical Editor Joseph Geschelin takes a look inside the unit

AT THE Auto Show last January International Harvester Company displayed a cutaway model of its Select-O-Matic transmission and released brief news material on its operational features. This article presents for the first time complete design details of the unit.

A basic torque converter of high efficiency with an hydraulically-operated single-plate clutch are combined with a commercial 5-speed synchromesh transmission (at the present writing).

Development was along the line of semi-automatic operation (to the exclusion of fully automatic drives) with the torque converter constantly in action to reduce shock in the power train to the very minimum. The hydraulic clutch is actuated by finger-tip control at the top of the gear shift lever, thus eliminating the clutch pedal and relieving the driver of the task of clutch operation. Transmission shifting then is manual.

Net result is to give the driver complete control of drive operation at all times in selecting gear ratios for any road or traffic conditions.

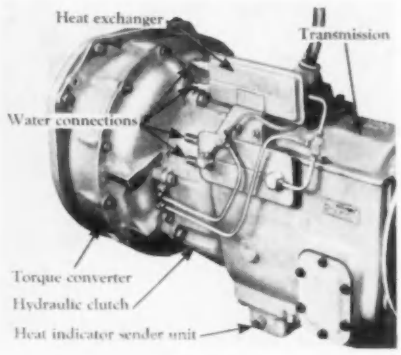
Heart of the drive is the torque converter. Since it is in full effect at all times, it must be capable of maximum efficiency so as to reduce drive losses to the minimum. The torque converter components are drive plate and ring gear, pump and housing element with cooling fins on the outside formation, turbine element, and reaction member or stator mounted on the one-way overrunning clutch.

It may be noted that the operating range of this torque converter is above the coupling point, in the region of maximum efficiency and will range downward to the flat portion of this curve at the top to a lower limit of around 93 per cent. Looking at the upper curve dealing with the capacity factor, it will be seen that the converter is always operating at top efficiency, very close to 100 per cent in direct drive.

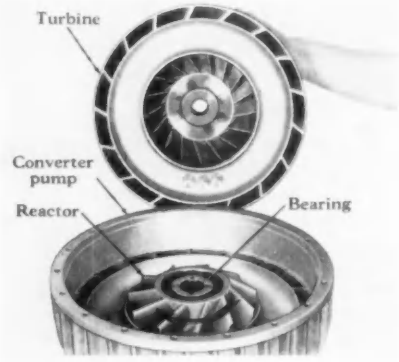
International has standardized on just two sizes—13 and 14-in.—to cover the entire gamut of 14 engines. However, within this size range, the converter for each individual engine is designed to suit engine torque characteristics. This is done in one of three ways: by modifying the hydrafoil configuration of an individual element or all three elements; by changing the number of blades; or by combining all three effects. In this manner each engine has, in effect, its own unique torque converter.

(TURN TO PAGE 166, PLEASE)

Here are the basic components of . . .

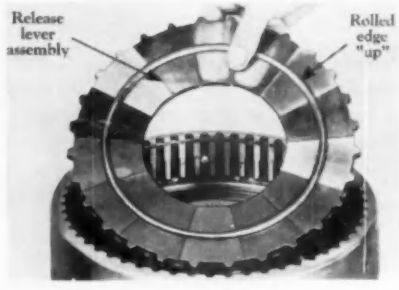


. . . the transmission itself



. . . the torque converter

. . . the hydraulic clutch



LIQUID'S NEW

ECONO-COLD

Offers three steps to Highest Profit Semi-trailer Refrigeration!

Step1 LOWEST COST

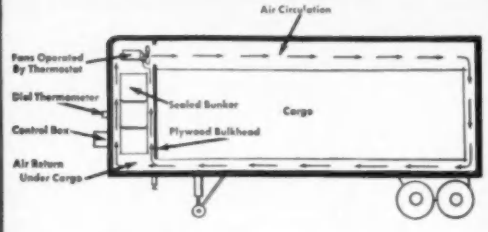
The ECONO-COLD unit for large semi-trailers costs less than $600. It weighs less than 300 lbs.—permitting greater payloads on dry trips. Maintenance is practically nil. It's ready to go when you want it. No down time or loss of loads to competitors.

Step2 LONGEST LIFE

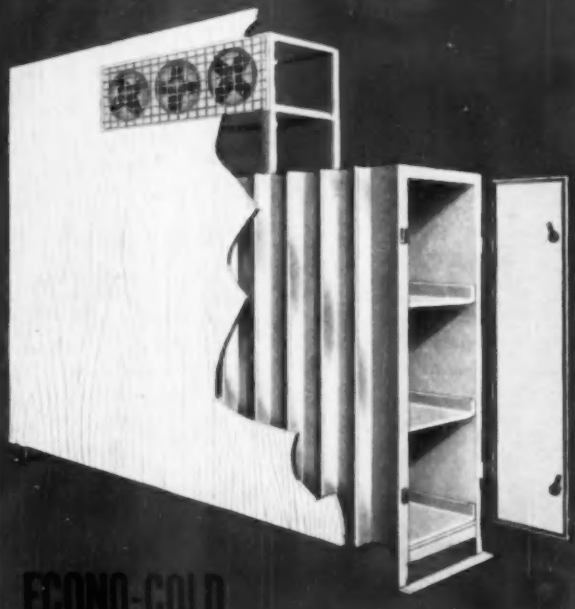
The basic unit of ECONO-COLD is made of non-corrosive aluminum. It will last ten years or longer . . . outlasting several mechanical units. There is no deterioration—even after long periods of disuse. Preventive maintenance consists of replacing 3 fan motors . . . (the only moving parts) . . . once a year.

Step3 GREATEST DEPENDABILITY

Mechanical risk is entirely avoided by using ECONO-COLD units. ECONO-COLD eliminates claims due to enroute failures. Simplicity of operation provides assurance against damage to equipment and lading—due to carelessness or neglect.



ECONO-COLD automatically maintains temperatures from −10 to +60°. It circulates air over, around and under the cargo, eliminating hot spots in the lower portion of lading. This improved design provides more air circulation and more refrigeration on demand than any other dry ice unit.



ECONO-COLD

A patented product of The Liquid Carbonic Corporation

World's Largest Producer of

THE LIQUID CARBONIC CORPORATION

Chicago 23, Illinois

THE LIQUID CARBONIC CORPORATION

3174 South Kedzie Avenue • Chicago 23, Illinois

☐ Please send me a copy of your new ECONO-COLD Bulletin.

☐ Arrange to have your representative call to give me specific details about new ECONO-COLD Semi-Trailer Refrigeration.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Truck's Body Goes UP and DOWN

Elevator-type design permits

53-in. range in loading height for faster, safer handling

AN ELEVATOR-TYPE body design for trucks and trailers has been developed by Thompson Trailer Corp., Pikesville, Md. The body may be raised to a maximum height of 53 in. or may be lowered until its floor rests on the street for curb-height loading.

Railway Express says it thinks the idea worth testing, will try a body out in New York City. First job will be express shipments of seafood in and out of the city's Fulton Fish Market.

Unloading time for the "Lo-Loader" is said to be 7 to 10 minutes. In test runs, loads of 21 refrigerators were unloaded in an average time of 12 minutes.

To get the low loading, the rear axle and conventional drive shaft have been eliminated. Drive is on the front wheels.

Rear wheels are mounted on spindles attached to a lever. The front end of the lever pivots about a stub shaft attached to the under structure of the body. The rear end of the lever incorporates a cantilever spring which engages a retractable spring pad for driving position.

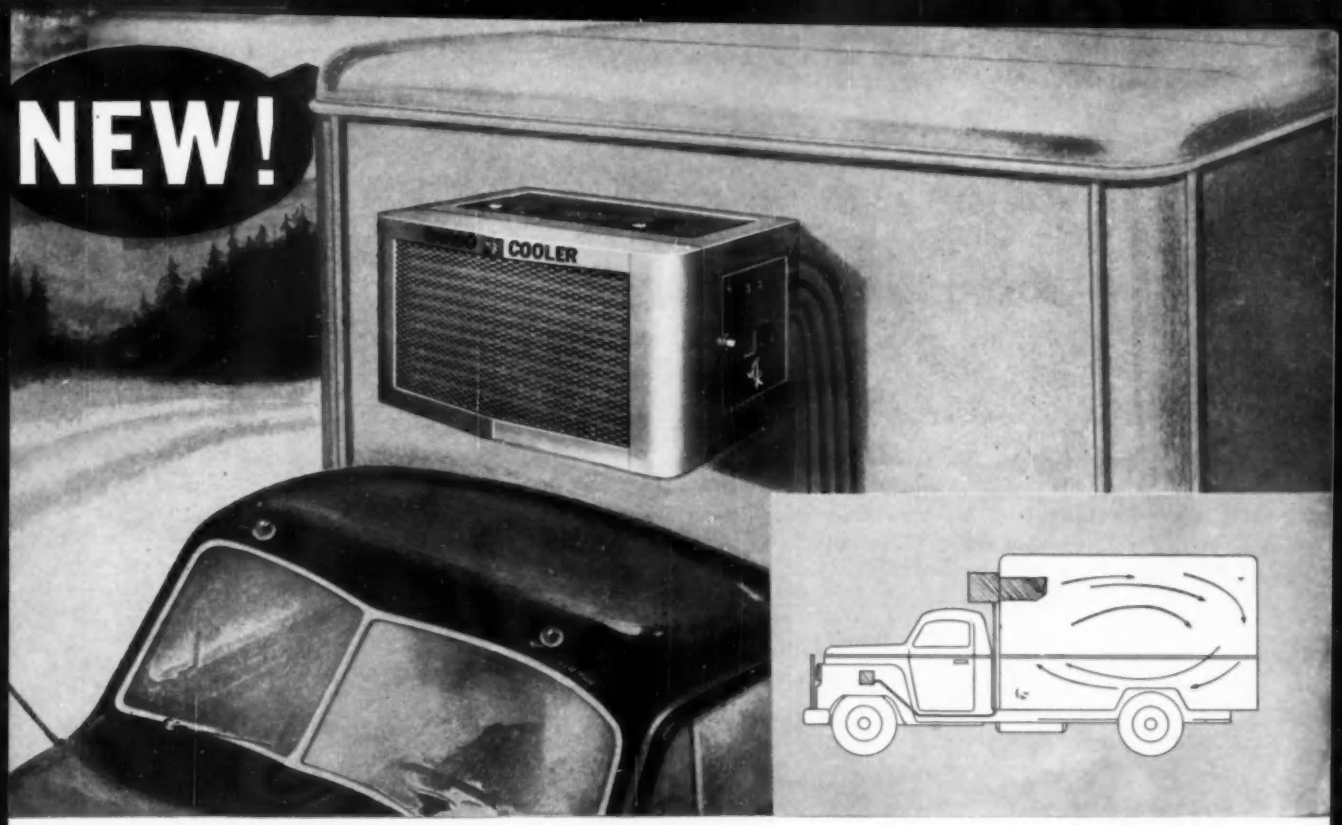
When the body is lowered below driving position the spring pads are moved out of the way permitting the rear end of the spring to move upward without interference. A hydraulic cylinder attached to each rear wheel provides the power for height adjustment.

The rear wheels, levers and springs simply move vertically upward into wheel housings much the same as aircraft landing gear is retracted. The spring pads are also moved by a hydraulic cylinder.

Connecting the body and the chassis of the truck which carries the engine, driving front axle and cab are mating channels which not only provide the connection, but act as the elevator guide. In this connecting frame is a third hydraulic cylinder. This portion of the elevating mechanism is much the same as that of a fork truck.

(TURN TO PAGE 148, PLEASE)

Thompson Trailer Co.'s "Lo Loader" drops to curb level for on-street loading or unloading as shown above. For delivery docks the body can be raised to 53-in. maximum height, see below. The unit has front wheel drive. Rear wheels are mounted on spindles attached to a lever. The elevator controls are under panel at right rear of body



HUNTER CARGO COOLER

MORE REFRIGERATION

LESS WEIGHT

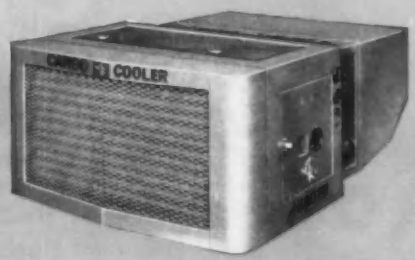
LOWER COST

The new Hunter Cargo Cooler for trucks is a revolutionary mechanical refrigeration unit of advanced design for positive, dependable protection of cargos in the moderate temperature ranges at remarkably low cost.

Weighing only 315 pounds and extremely compact, it has a net cooling capacity of almost 1½ tons (at 20°F. evaporator, 90°F. ambient) — *an unprecedented and unequalled high in cooling capacity per pound of weight.*

Its hydraulic drive assures maximum cooling capacity regardless of vehicle engine speed. Automatic thermostatic control assures maintenance of positive, pre-set temperatures. Powered by the vehicle engine while enroute, it is also available (as Model HE-20-A) with A.C. standby motor for dock-side or overnight refrigeration.

Write for Complete Description and Specifications — Models H-20-A, HE-20-A.



HUNTER CARGO COOLER MODEL H-20-A HYDRAULIC-DRIVE REFRIGERATION UNIT

- **High Volume, Low Velocity Air Flow — Minimizes Dehydration of Cargo.**
- **All Parts Easy to Get at.**
- **Weighs Only 315 Pounds — Permits More Payload.**
- **Only 18" Projection into Body — Allows More Payload Space.**
- **Modern Design — Built of Stronger, Lighter Materials.**
- **Simple and Easy to Install.**
- **Low Initial Cost. Low Operation and Maintenance Costs.**

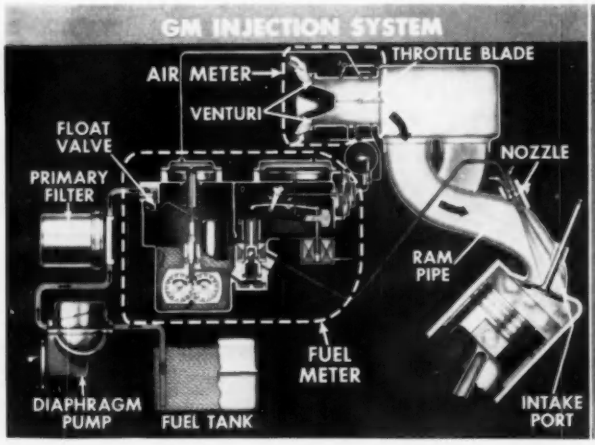
HUNTER MANUFACTURING COMPANY

Transport Heating and Refrigeration

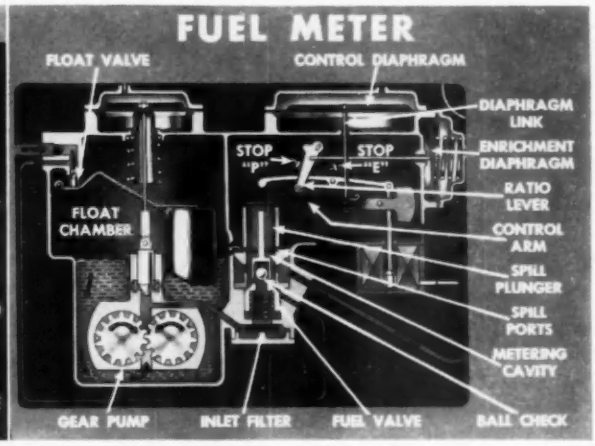
30525 AURORA ROAD • SOLON, OHIO

How GM's Fuel Injection Works

Here is an unusually complete description of the control mechanisms of General Motors' Fuel Injection System. The schematic diagrams and text below were excerpted from a paper by George P. Ransom of the General Motors Engineering Staff presented at the National Tank Truck Carriers Convention in Detroit (see page 66, this issue).



The fuel injection system



Detail of its fuel meter

AT GENERAL Motors we studied and tested a a number of fuel injection systems over a period of years. We chose what we thought the best from the standpoint of simplicity, manufacturing cost, service requirements and reliability. It is known as a continuous flow system with a "mass air flow" control. It derives its name from the fact that all fuel metering is controlled by the movement of air through a venturi.

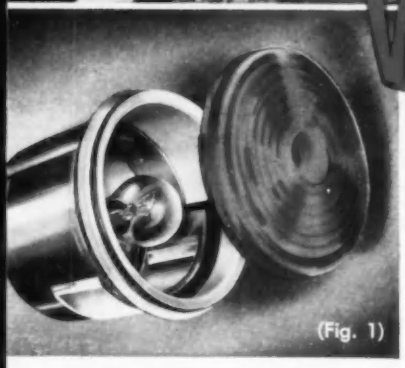
Fuel is pumped by a conventional pump from the fuel tank through a filter to a float bowl within the fuel meter. A gear pump submerged in the float bowl and driven at half-engine speed furnishes fuel under pressure to the metering cavity. From there the fuel is either spilled back to the float bowl or flows through the injection lines to the nozzles where it is injected into each intake port continuously.

Air is controlled by a butterfly valve (or throttle blade) through a linkage to the accelerator pedal. This is the only control required of the driver, the same as in a carburetor system.

The control system functions as follows: The air flowing to engine passes thru the venturi section to produce a signal, or a partial vacuum, that is applied to a control diaphragm thru a connecting line. The value of signal is directly related to the amount or mass of air flowing thru the venturi, thus it is called "mass air flow" control. (Schematic diagrams above will help you follow this movement.)

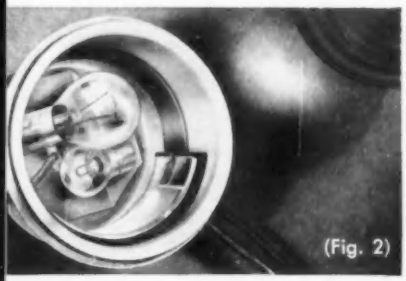
The fuel metering system responds to the venturi signal by a balance of

(TURN TO PAGE 106, PLEASE)



(Fig. 1)

SNAP-ON LENS! No screws or doors to loosen, leak or rattle. Removes easily with a twist of coin or screwdriver.



(Fig. 2)

ONE OR TWO BULB TYPE! Two bulb style (Fig. 2) uses two 1-filament bulbs — one for stop and one for tail light. One bulb style (Fig. 1) uses single 2-filament bulb.

STOP AND TAIL LIGHTS!

Rain will never penetrate a light that withstands the full force of a high-pressure fire hose! The new 107 series of Dietz waterproof stop and tail lights are positively moisture tight . . . as proved by rigid tests to S.A.E. standards for waterproofing.

Each light is sealed by an O-Ring in front . . . and by a rubber compression-grommet to protect the bulb socket in back. There are no springs to rust out, and the die-cast zinc housing will not corrode.

THREE TIMES BRIGHTER! Available in 6V or 12V, one or two-bulb type. There are 7 different mounting styles to choose, each offering license plate illumination.

YOUR DIETZ JOBBER has all the facts, See him or write us for a catalog sheet. R. E. Dietz Co., 225 Wilkinson St., Syracuse, N. Y. Manufacturers of the most complete line of automotive lighting and safety equipment in the world.

"Go **DIETZ** *and you go safely"*

GM's Fuel Injection System

Continued from Page 104

fuel pressure against signal strength. The signal, acting on the control diaphragm and thru the system of linkage and levers, produces a downward force on the spill plunger. This downward force is opposed by fuel pressure on the bottom of the spill plunger, so the plunger will move up or down to open or close the spill holes until the forces are balanced. The metering action is instantaneous with change of signal, thus the need for an accelerating pump is eliminated.

The fuel from the nozzles is proportional to the air to the engines. In other words, the metering system maintains a constant fuel/air ratio. However, the engine wants a leaner ratio for part throttle and a richer ratio for full power. This ratio change is obtained by a movable fulcrum called the "ratio lever," which changes the effective lengths of the control lever, and is actuated by a diaphragm which shifts at a selected manifold vacuum.

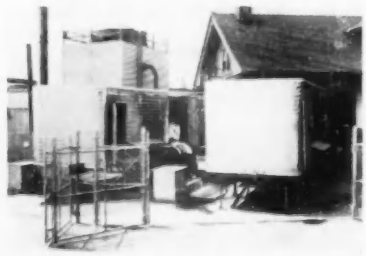
During deceleration with closed throttle, the manifold vacuum exceeds normal idle vacuum. As the throttle reaches the closed position, this higher vacuum may be used to cut off the fuel to the nozzles or what we call a "coasting shut-off." A spring-loaded diaphragm, engaging a valve in the gear pump, dumps the pump output to the float bowl as the higher vacuum is applied. As the engine slows to idle speed, the valve closes to maintain normal idle operation.

Other features of the fuel injection include the usual idle adjustments and an automatic cold starting and warm-up enrichment device, for the same purpose as the automatic choke on a carburetted engine. However, the economy is better than carburetor during this period, because less enrichment is required with fuel injection on a cold engine.

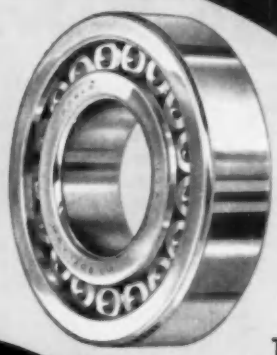
END

Please Resume Reading Page 108

1500 Tons of Cooling



World's largest portable air conditioning system will make club house patrons of the Balmoral thoroughbred racing season comfortable this summer at Washington Park in Chicago. The system is housed in two 32-ft trailers. The York refrigeration equipment in the two trailers can produce the equivalent of 1500 tons of cooling.

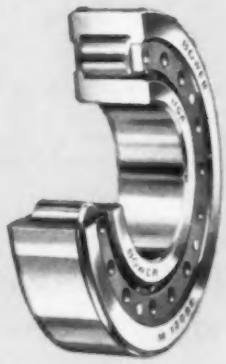


TWO-LIP

STRAIGHT ROLLER BEARINGS

You can profit substantially

Bower straight roller bearings carry maximum loads with less maintenance because Two-Lip design—available at no premium in Bower straight roller bearings—increases rigidity and keeps rollers in proper alignment at all times. Precision-built rollers give quieter, smoother operation. It pays to specify Bower for your replacement bearing needs. Bower roller bearings—tapered, straight and journal assemblies—are available through most leading bearings suppliers.



1 Two-Lip race increases rigidity and keeps rollers in proper alignment.

2 Composite steel cage does not contact rollers during normal operation.

3 Precision-built rollers and races are made to support maximum radial loads.

BOWER
roller bearings

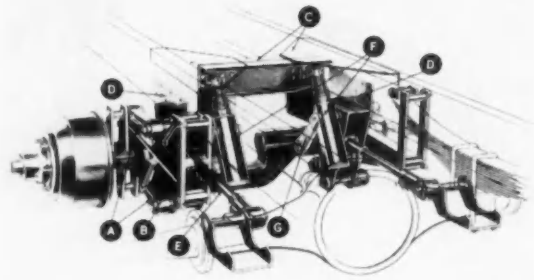
FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC.

Truckstell Announces New 3rd Axle Suspensions

NEW LINE of Hydro-Trac light-weight third axle suspensions has been introduced by the Truckstell Mfg. Co., Cleveland, Ohio. It includes single-tire pushers, dual-tire pusher and trailing axle designs.

Main feature of the Hydro-Trac design is a simple cab-controlled hydraulic system which permits the driver to change the geometry of his tandem to improve traction. With this system, the driver may transfer up to 25 per cent of the load carried on the third axle to the drive



axle. He may also raise and latch the third axle completely free of the road.

The new line includes a number of changes in the original Hydro-Trac design. Features shown in the illustration include:

A—**Rubber-mounted torque rods in parallel arrangement.** Rods transmit braking forces directly to truck frame. Provide "automatic tracking", keep axles aligned on straightaways and permit 3rd axle to track steering axle on curves.

B—**Free-End Walking Beam with Lifting Block.** The beam provides maximum flexibility and insures against "hanging" of the drive axle.

C—**Cross Member and Gusset.** Integrates suspension to the frame. Eliminates need for extra-weight frame "beefing."

D—**Trunnions.** Act independently in supporting load on each frame. Provide for wide distortion-free frame flexibility.

E—**Rubber-Mounted Radius Rods.** Located on pusher drive axle. Transmit all driving forces directly to the frame. Insure perfect axle alignment. Eliminate spring and center-bolt breakage at drive axle. Reduce strain on drive line and universal.

F—**Twin Hydraulic Cylinders.** Straddle mounted. Operated by electrically driven hydraulic pump. Mechanically transfer weight from 3rd axle to drive axle. Twin-cylinder design insures that load transfer is equal at both left and righthand sides, even under the most uneven of road surfaces.

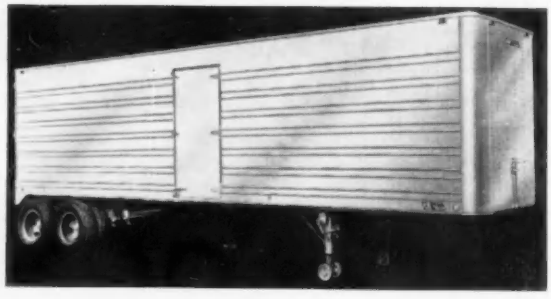
G—**Trunnion Shaft and Lifting Arm.** Apply force to full-floating trunnion shaft and cam assemblies, transferring weight from 3rd axle to drive axle.

The suspensions are designed for tandem bogie rating up to 40,000 lb. The single-tire pusher weighs 665 lb, provides 65-35 per cent weight distribution. Dual tire pusher weighs 680 lb and the trailing suspension weighs 605 lb. Both have 50-50 weight distribution.

Three Trailer Makers Announce New 48'er Van

THE 48'ER VAN made its debut last month. It's the result of joint research, engineering and manufacturing of three trailer companies: American Body & Trailer, Inc., Oklahoma City, Okla.; Utility Trailer Mfg. Co., Los Angeles; and Great Dane Trailers, Savannah, Ga.

Models are available with corrugated outside panels or with extruded aluminum exterior posts. Straight frame



or drop frame design is available. The 48'er has a 10-in. front corner radius which provides useable space up to the nose of the unit, as well as giving the cab more clearance for easy handling. Nose and side sheets are of aluminum supported by rolled steel vertical posts. Side sheets overlap at the vertical posts for complete watertight protection. Integral top and bottom rubrails provide additional strength and additional weather protection. Lock-seamed galvanized steel sheets are used on the roof.

Stressed Skin Construction

The aluminum outer skin is applied to the steel framework with a close rivet pattern which allows a "stressed skin construction" as an integral part of the total structural design. Steel cross members on 16 in. centers and the one-piece top and bottom rails are said to give this unit maximum strength per pound of weight.

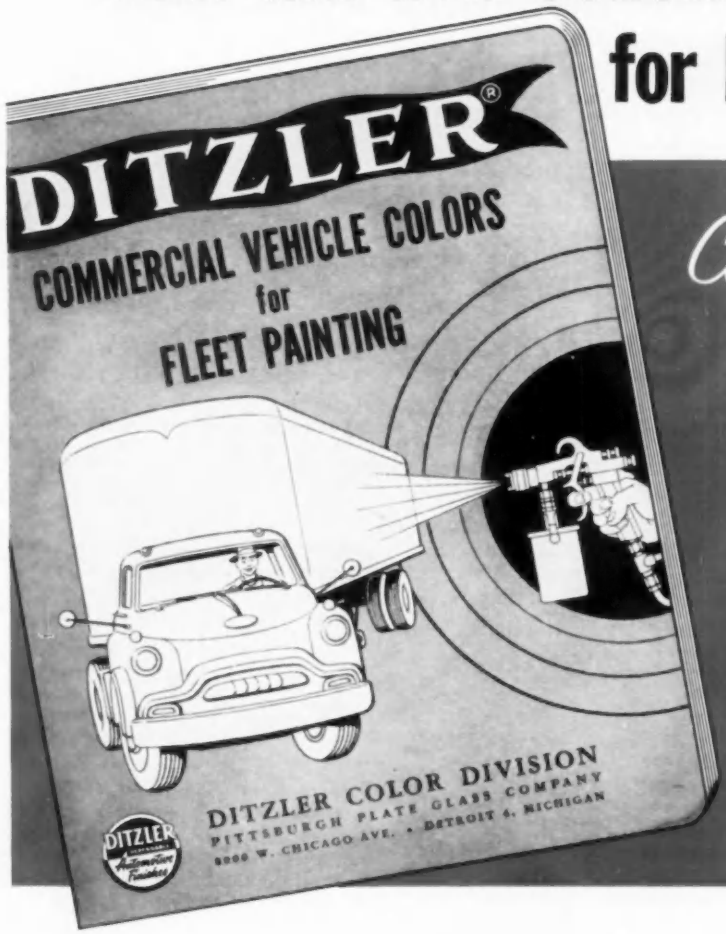
The plywood lining in the sides is recessed between the uprights to give a completely smooth interior wall. With the lining this unit offers an inside width of 93 in. clear, with an outside width of 96 in. Various inside heights up to 94⅜ in. at the eaves are available. Tongue-and-groove flooring to specification provides an easily loaded, easily cleaned unit. Full length rear doors offer a 90 in. clear width.

Welded into One Unit

The rear frame assembly is strong, welded, heavy-gage steel joining the rear header, side rails and understructure into one rigid structural unit. Rubber gaskets around each door weatherstrip the openings for complete cargo protection. Plywood-lined doors are reinforced to assure against warping and sagging. Regulation step-type steel bumper is reinforced to the understructure and is solidly welded to the heavy-duty frame. Recessed Class "A" turn signal lights are fully protected. Reinforced rubber mud flaps are standard equipment on all units.

Flanged, wide-angle skid plate and a long upper 5th wheel plate gives extra strength to the unit. Rigidly mounted, mushroom-head kingpin can have a setting of up to 42 in. to meet all hauling requirements.

Now...Ditzler Makes Color Styling Easier with this new COLOR SELECTOR for Fleet Painting!



Contents Include:

- ★ New Fleet Color Selector Cards
- ★ Suggested 2-Color Combinations
- ★ Truck Production Colors as Far Back as 1951
- ★ Truck Color Listings for All Makes, Since 1934
- ★ National Fleet and Special Equipment Color List
- ★ General Painting Instructions

DITZLER'S new Color Selector is a comprehensive 80-page volume of timesaving color information every fleet painter needs. Contains sample chips of Ditzler's wide range of colors for commercial vehicles, including attractive two-tone suggestions. Puts at your finger tips chips of standard production colors since 1951 and an alphabetical listing of colors used by commercial vehicle manufacturers since 1934.

• **You'll also find here** national fleet and special equipment colors with matching Ditzler code numbers. There's also a section of practical hints for painting commercial vehicles with standard lacquer or enamel finishing systems. We'll be glad to send you a copy of this practical and useful Color Selector without cost or obligation. Just fill out and mail coupon.

Send This Coupon Today!

Ditzler Color Division
Pittsburgh Plate Glass Company
8000 West Chicago Blvd.
Detroit 4, Michigan

Gentlemen: Please mail me a copy of your New Fleet Color Selector.

Name_____ Title_____

Firm Name_____

Address_____

City_____ State_____

DITZLER®

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

July News Roundup

1957 Truck Trailer Shipments

Type	April	Four Months
Vans		
Insulated and refrigerated	463	1,546
Steel	60	238
Aluminum	403	1,308
Semi-insulated	55	289
Steel	10	45
Aluminum	45	244
Furniture	186	706
Steel	150	637
Aluminum	36	69
All other closed-top	1,473	6,983
Steel	731	3,482
Aluminum	742	3,501
Open-top	302	1,199
Steel	135	643
Aluminum	167	556
Total—Vans	2,479	10,723
Tanks		
Petroleum	454	1,702
All other	199	532
Total—Tanks	653	2,234
Pole, pipe and logging		
Single axle	36	149
Tandem axle	67	245
Total	103	394
Platforms		
Racks, livestock and stake	355	646
Grain bodies	155	589
Flats, all types	538	2,464
Total—Platforms	1,048	3,699
Low-bed heavy haulers	359	1,135
Dump trailers	243	744
All other trailers	315	1,126
Total—Complete trailers	5,200	20,055
Chassis only	258	1,057
Total—Trailers and chassis	5,458	21,112

Source: Industry Division, Bureau of the Census.

Federal License Tag

There'll be no federal license plate issued in connection with payment of the federal highway use weight tax. Internal Revenue Service says difficulties involved in buying them, controlling and issuing them would offset any value such plates might have in enforcement.

For the fifth consecutive year, Commercial Car Journal has won the National Safety Council's Public Interest Award for its editorial support of traffic safety. Shown above is CCJ Editor Bart Rawson receiving the honor from George Lowe (Atlantic Refining Co.), chairman of the Street and Highway Committee, Philadelphia Chamber of Commerce.

CCJ Author Honored

Army Transportation Corps Safety Director Donald S. Buck, author of several outstanding safety articles appearing in COMMERCIAL CAR JOURNAL, has been cited for Meritorious Civilian Service and Sustained Superior Performance of Duty. The citation by Major General Paul F. Yount, Army Chief of Transportation, pays tribute to his "outstanding ability in presenting transportation accident prevention methods and techniques. . . ."

Buck is credited with developing and putting into operation the Transportation Corps' motor vehicle safety program which has become standard for the entire Army. The program helped the Transportation Corps win an Army Award of Merit for its safety achievements during 1956.

Articles by Buck appearing in CCJ recently include "A New Way to Rate Accidents" (Feb. '57, page 66), "Road Signs — Do They Guide or Confuse?" (Mar. '55, page 66), "How Much Does Courtesy Pay" (Jan. '54, page 72).

Transit Awards

American Transit Assn. has awarded 18 honors in its annual traffic safety competition. Of the 100 fleets participating, the collision rate was

(TURN TO PAGE 206, PLEASE)

First Quarter Intercity Truck Tonnage

By Regions

Region	First Quarter 1957*	First Quarter 1956*	Per Cent Change
New England	4,414	4,196	+ 5.2
Middle Atlantic	17,055	16,474	+ 3.5
Central	21,413	22,331	− 4.1
Southern	9,023	8,767	+ 2.9
Northwestern	4,122	3,881	+ 6.2
Middlewestern	4,610	4,604	+ 0.1
Southwestern	5,744	5,368	+ 7.0
Rocky Mountain	2,389	2,194	+ 8.9
Pacific	7,442	7,831	− 5.0
United States	76,212	75,646	+ 0.7

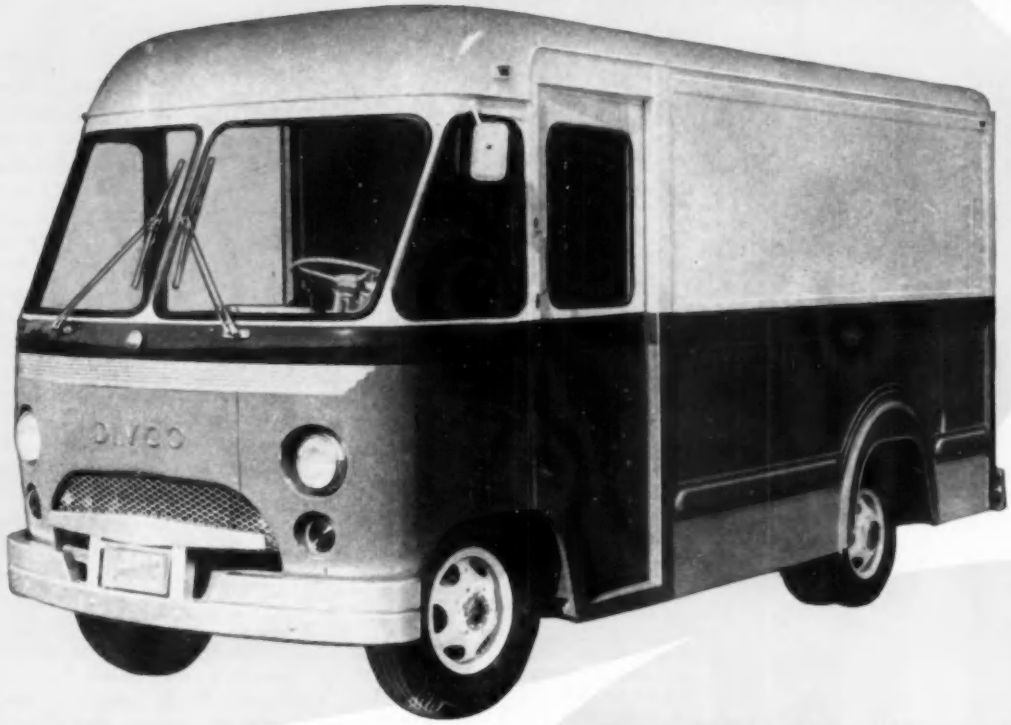
By Commodities

Commodity	First Quarter 1957*	First Quarter 1956*	Per Cent Change
General Freight	36,079	36,566	− 1.3
Household Goods	250	231	+ 8.3
Heavy Machinery	769	698	+10.2
Liquid Petroleum	20,508	19,540	+ 5.0
Refrigerated Liquids	377	356	+ 5.9
Refrigerated Solids	722	641	+12.6
Agricultural Commodities	766	742	+ 3.3
Motor Vehicles	3,294	3,048	+ 8.1
Building Materials	1,818	1,915	− 5.0
All Other	11,627	11,908	− 2.4
Total	76,212	75,646	+ 0.7

* In thousands of tons. Covering 2120 ICC Class 1 and 2 intercity common and contract motor carriers of property as reported by ATA Research Dept.

These BIG NEW WALK-IN SERIES DIVCOS

do an economical job on HEAVY WHOLESALE ROUTES!



Model 41 — 470 Cu. Ft. Cargo Space, 130 In. Wheelbase

Model 51 — 412 Cu. Ft. Cargo Space, 117½ In. Wheelbase

● DAIRIES! Ice Cream Plants! Frozen Food Suppliers! Here is the new type, big-payload Dividend Series DIVCO so ruggedly constructed that it will last for many extra years. This outstanding example of Divco long-life engineering is available with or without insulation, and/or refrigeration. In 10 ft. panel bodies. In 12 ft. panel bodies. New extra rugged Divco chassis. New Super Six valve-in-head engines. Several optional features. Designed for minimum maintenance. Exceptional engine accessibility. The ultimate result of Divco's 30 years experience building route trucks known everywhere for endurance, operating and maintenance economy, efficiency, dependability.

5 TYPES OF BULKHEAD OPENINGS—

When factory installed insulation and refrigeration is specified, the following bulkhead features are optional: (1) Twin Sliding Doors; (2) Single Sliding Door; (3) Dual Sliding Center Opening Doors; (4) Dutch Doors; (5) Solid Bulkhead. Also Special Curb-side Door.

DIVCO TRUCK DIVISION
DIVCO-WAYNE CORPORATION
DETROIT 5, MICHIGAN

Over 80% of all DIVCOS built are still in use!

Blue Plate Designs for Towing

Continued from Page 77

4. Temporary Light Assembly

Our rig for the running lights on a towed tractor is simple but complete. It is mounted on an eight-ft length of 1½-in. angle iron. Shielded trailer running lights mark the outer ends of the iron. Tail lights and directional lights are close to each end, and a jumbo stop light is somewhat left of center. Heavy cable is just long enough to reach around the cab to the head tractor's trailer light plug-in.

The tail lights are converted directional lights, and show both forward and back. Being nearest to the ends of the angle iron they help mark the spread of the rear wheels. We find folks give us plenty of room when we have to tow in at night. However, a regular PM schedule makes this a rare job these days.

Fifth Wheel Shims

We have replaced the wooden shims between the tractor frame and the base of the fifth wheel with lengths of heavy channel iron. This has stopped the play that sometimes sheered bolts and stripped threads. The channel iron lies open side up on the frame. It is tackwelded to the frame in three places on each side of an iron, and is welded to the fifth wheel base above it in the same way.

To stop the shifting with wooden shims we used to weld strap irons between the fifth wheel base and the tractor frame. These straps broke loose every few weeks. Now the first channel irons installed have gone a year without breaking a tackweld.

Air Scoops

We wanted more air in the sleepers on those hot summer nights. With light sheetmetal we made air scoops like those on the back of some buses and set them over the exhaust vent above the bunks. This made them air intakes instead. The back of the scoop is an open slot so that moisture doesn't collect but blows on through. Heavy fine mesh wire covers the front of the scoop. Besides bugs and dirt, it screens out a lot of rainwater. What does come through hits the back of the scoop and runs down to the slot.

The shutter in the circular vent in the cab roof meters the air flow nicely. We would like to distribute the air better. This year we will try louvre-type shutters to shunt the air around the berth, and are fairly certain this will work. Even so, our men have been well pleased with the present air scoop set-up.

END

Please Resume Reading Page 78

Truck breakdown? (Get The Hertz Idea)

A truck breakdown at the busiest time of year! What happens? Deliveries don't get out on time. Orders pile up. *Customers complain.* Sound familiar? Well, it doesn't have to if you rent the extra truck you need from Hertz. Just pick up the phone, and it's yours—fast!

That's The Hertz Idea. Just send your driver to Hertz with proper driver's license and identification. We'll give him the keys to a clean, modern Chevrolet or other sturdy truck. Rent it only as long as you need—by the hour, day or longer.

Low rates, too. Hertz includes all gasoline, oil and proper insurance. In Los Angeles, Calif., for instance, a 1½-ton van truck costs only $7.00 for 12 hours, plus 10 cents a mile (lower by the week). Cost for a 30-mile trip? Just $10.00! Rates vary slightly in different cities.

You can't miss getting fast, dependable service. So call your local Hertz office. We're listed under "Hertz" in *alphabetical* phone books everywhere. Hertz Truck Rental, 218 South Wabash Avenue, Chicago 4, Illinois.

Hertz rents Chevrolets or other sturdy trucks in ½-, 1- or 2-ton sizes with pick-up, panel, van or stake bodies.

Most experienced...by far

HERTZ
Truck Rental

Fleet Courses

HERE is an up-to-date calendar of fleet training courses for 1957. For complete addresses to write to for further information about the courses listed, see the Fleet Course Directory appearing in the November, 1956, issue, page 314.

Driver Training

North Carolina State College—One month long courses begin July 29, Sept. 2, Sept. 30, Oct. 28, Nov. 25.

Fleet Maintenance

University of Oklahoma—Sept. 16-20.

Rutgers University (N. J.)—Sept. 30-Oct. 4.

University of Alabama (course will be held in Tuscaloosa)—Oct. 7-11.

Purdue University (Ind.)—Oct. 14-18.

Oregon State College—Nov. 5-7.

Fleet Operation

These courses usually meet one night a week for about 10 weeks. Where they are planned for cities other than where the sponsoring school is located, the name of the city is shown in parenthesis. Latest available schedule shows the following schools plan such courses but no dates have been announced.

University of Kansas (Wichita).

American University (Washington, D. C.).

Ohio Mechanics Institute (Cincinnati).

Purdue University (Ind.).

Syracuse University (N. Y.).

Northwestern University (Ill.).

University of Wisconsin (Milwaukee).

Fleet Supervisor

Pennsylvania State University—Sept. 9-13.

Purdue University (Ind.)—Sept. 16-20.

Georgia State College of Business Administration—No dates set.

Terminal Management

University of Louisville (Ky.)—Aug. 5.

Pennsylvania State University—Sept. 30-Oct. 4.

Georgia State College of Business Administration—No dates set.

Top Management

Tulane University (La.)—Oct. 11.

Northeastern University (Mass.)—Oct. 15.

University of Kansas—No dates set.

Oil Analysis Guides Bus Service

Continued from Page 71

out of its service stall. A prompt report saves us a lot of paper work and, very importantly, permits us to catch a problem before it has caused engine damage.

First reports showed that the oil in all coaches was perfectly satisfactory after 8000 miles of operation. So we went immediately to a 10,000-mile oil change. Samples were taken at our 2000-mile inspection period to be sure that no troubles occurred. After a year's trial period we went to a 16,000-mile change, and gradually increased the oil change period and now have set up a 20,000-mile change period for diesels; 30,000-mile change for gasoline jobs. Thus, we are getting 2½ times the oil mileage obtained in 1949—without damage to engines as our following records will show.

We find that even at this point 90 per cent of the oil is in good shape after 20-30,000 miles. It has not lost an appreciable amount of additive due to the fact that make-up oil is being continually added over this period. We have found absolutely no trouble with acidity and little contamination or dilution due to the fact that we catch troubles that would cause breakdown at the 2000-mile inspection intervals.

Records show that we are getting 159.09 miles per quart for a fleet average or 139.70 miles per quart with original and make up oil. On the Hall Scott engines we are getting 230,000 to 250,000 miles on a set of rings as a fleet average. The GMC 4512 engines have run on an average of 250,000 miles at this time—with no evidence of ring wear. We feel that we may get as much as 500,000 miles on this engine without having to re-ring. While these figures may mean little to other fleets, they do show, I think, that we are extending oil life—safely.

For recording analysis results we use a form which shows the following items: engine number, quarts of oil added since the last report, viscosity of the oil expressed as a percentage of its SAE number, asphalt content, water content, quantity of solids expressed as a percentage of the sample, presence of metal, acidity, oil, filter, remarks and initials of the person who made the test.

Viscosity may go down to 70 per cent of the SAE number before we decide that it is unsafe for continued use. When the asphalt content reaches 0.3, we replace the oil.

Any evidence of water, of course, is a signal for an oil change, but more importantly, it signals a thorough investigation of the source of the contamination. When solids show anything

(TURN TO PAGE 119, PLEASE)

NEW DIAMOND T MODEL 831

Light-weight powerhouse with

HALL-SCOTT 590 ENGINE

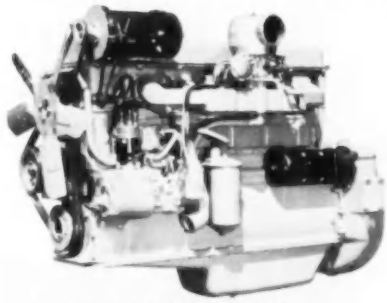
GAS—239 ACTUAL H.P. • LPG—256 ACTUAL H.P.

Want 1500 lbs. more payload every trip? Check the table at the right—it shows more usable power per pound than any comparable heavy-duty tractor. Model 831 is just what the headline says, a "light-weight powerhouse," outperforming big diesels and saving nearly a ton of chassis weight.

And the Hall-Scott 590 engine is as famous for endurance as performance. Minor adjustments are few and far between and overhaul periods are measured in the hundreds of thousands of miles. It is first choice for long life, reliability and economy with maximum loads. It is available for LPG fuel as well as gasoline.

Every Diamond T "custom-built"

Diamond T builds a complete line of heavy-duty motor trucks—gas and diesel—each "custom-built" to match the job precisely. See for yourself how much truck performance, economy and service you can buy. Look in the yellow pages for your Diamond T dealer or write the Diamond T Motor Car Co., Chicago 23, Illinois.



HALL-SCOTT 590

Fuel	Gasoline	L.P.G.
Max. Power	239 h.p. @	256 h.p. @
Governed Speed	2800 r.p.m.	2800 r.p.m.
Max. Torque	501 lbs. ft.	530 lbs. ft.
Bore & Stroke	5"x5"	5"x5"
Displacement	590 sq. in.	590 sq. in.
Camshaft	Overhead	Overhead
Crankshaft	3¼"	3¼"
Crankpin	3"	3"
Bearings	Precision	Precision
Oil Capacity	3½ gal.	3½ gal.
Weight	1275 lbs.	1275 lbs.

MODEL 831

Base Chassis	Gas	LPG
Wgt. (Approx.)	9000 lbs.	9700 lbs.

DIAMOND T TRUCKS

Established 1905

The Diamond is for Quality

JOHN D. LOCKTON

Portrait by Fabian Bachrach

". . General Electric People Have Purchased More Than $513 Million in Savings Bonds

"Since the inception of the Payroll Savings Plan for the systematic purchase of Series 'E' Bonds, May 1941, General Electric people have purchased more than $513,000,000 in Bonds.

"Since October 1948, when the General Electric Company's Savings and Stock Bonus Plan was installed, the Company has contributed, as a bonus on Savings Bond purchases – 962,000 shares of General Electric stock, worth $21,000,000 at the time of contribution and $58,000,000 currently.

"Our Bond-buying employees are truly shareholders in America – building their personal security and aiding the Government in its effort to manage the national debt in a way that is not inflationary.

"As Savings Bonds Chairman of New York State, I have undertaken the important job of encouraging other companies to install the Payroll Savings Plan as a service to their employees. I am proud of the fact that New York State has more than 800,000 systematic savers enrolled in the Payroll Savings Plan."

JOHN D. LOCKTON, *Treasurer*
General Electric Company

For help in installing the Payroll Savings Plan . . . or for assistance in building employee participation in an existing plan, write to: Savings Bonds Division, U. S. Treasury Department, Washington 25, D. C.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

COMMERCIAL CAR JOURNAL

Oil Analysis

Continued from Page 116

more than three per cent as taken from the sample, we change the filter. This may show up at 2000 miles, or it may, under certain conditions, last for 20,000 miles. The point to remember, of course, is that the oil is perfectly good until evidences of solids show up in the samples.

Any evidence of metal signals an analysis of the metal to determine where it is coming from. We can tell very simply whether it is from rings, cylinder walls, piston skirts, bearings or the front thrust washer.

It should be stated, however, that this test is primarily a safety check. We very seldom find this condition but we perform the test religiously as a protective measure. The same is true for the acidity test. We have not found over-acidity more than twice since the program was installed. But, since we are getting such long life from the oil, we feel that a periodic check is well worth the time expended in making it.

A complete test of samples from six vehicles can be made in a 90 min period. One man, George Schurzky, has been trained to handle the equipment and has become quite expert in reading results. He takes samples from the coaches as soon as they are brought in for the 2000-mile inspection. He runs them through the various tests and fills in the analysis form, then returns it to the shop foreman while the coach is still on the inspection lane. The extent of the inspection is then guided by the results as shown on this form.

There are several modifications we have made to the equipment to make it more convenient for handling crankcase samples. First is the heated compartment, shown on this page. This is used to bring the oil up to room temperature prior to making the viscosity check. The oil sample is placed in this cabinet along with the metal containers used in the viscosity checks and the various SAE grades of new oil. This, as can be appreciated, is necessary when viscosity of the used oil is compared with that of the new oil.

The compartment is heated with two 120-watt bulbs. A thermometer and thermostatic switch is

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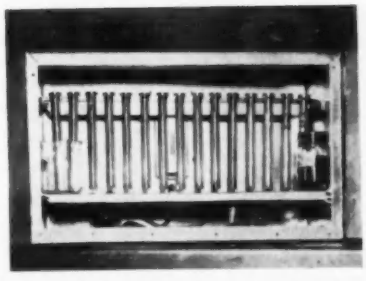


This heated compartment is used before viscosity tests. Oil samples and new oil are heated to room temperature. Heat is supplied from two 120-watt bulbs and may be held at a constant temperature if desired

Oil Analysis

Continued from Page 119

mounted inside the compartment so that control of temperature can be maintained at a predetermined point. This modification saves time when oil samples are taken from cold engines.

The viscosity tester shown on page 70 has been mounted permanently on the work bench at the required angle and convenient to the operator. This saves time in locating the tester and assures us that the prescribed position is maintained. Holder brackets for the tubes have been slotted so that samples can be slipped into place without disturbing the tester board. A handy holder for six oil samples was made up for convenient carrying of them to and from the vehicle.

Another innovation made-up by our shop is the method of handling the two solvents used in the analysis. As shown in the top photograph on page 71, we mounted the Naphthene and the Benzene in one-gallon cans above the work bench. Petcocks and extended nozzles were installed for convenient access to these fluids.

Holder for the test tubes used in the centrifuge is a simple stand drilled to take the tubes and the graduates used for each sample. It is shown next to the centrifuge on page 71. Cleaning of these vials was a major problem before we designed our own power jet cleaning machine. This is nothing more than a one-gallon container into which has been mounted a spray nozzle. An electric fuel pump provides the power, pumping a low velocity stream of gasoline out through the nozzle. A starter switch is used to actuate the pump. Battery is located under the bench.

To use this cleaning machine the operator holds the graduate over the nozzle which extends just above the normal can filling the hole, as shown in the photograph on the bottom of page 71. Pressing the starter button directs a fine spray up into the vial or graduate. Excess gasoline drips down back into the can and is reused several times.

These ideas, of course, can only be applied to the Gerrin testers, but they show how equipment can be made versatile and convenient for any shop. We are not attempting to recommend any one make of testing facilities for analyzing oil, but we would only recommend that the practice be added to the shop routine. Regardless of what type oil analysis is used, it is my opinion that worthwhile savings can be enjoyed with its application to fleet maintenance. Without this service, we would be groping in the dark.

END

Please Resume Reading Page 72

Warehouse Foreman: "Tell me, Herman, does your wife drive your car?"

Hi-Lo Operator: "No, boss. It looked this way when I bought it."

Fleet Owners' Choice — FIRST

FOR ENGINE PERFORMANCE AND LOW COST MAINTENANCE

Experience proves dependability — and the experience records of fleet owners, everywhere, are the basis of Zollner Piston popularity. Today, as for many years, Zollner Pistons are the dominant choice of most engine builders and most fleet operators. For replacement as well as original equipment, Zollner Pistons are specifically tailored to individual engine requirements. You can always be sure of highest engine performance and lowest maintenance cost when you specify Zollner for every piston job.

Over *70%* of all Truck and Bus Manufacturers use and recommend

ZOLLNER PISTONS

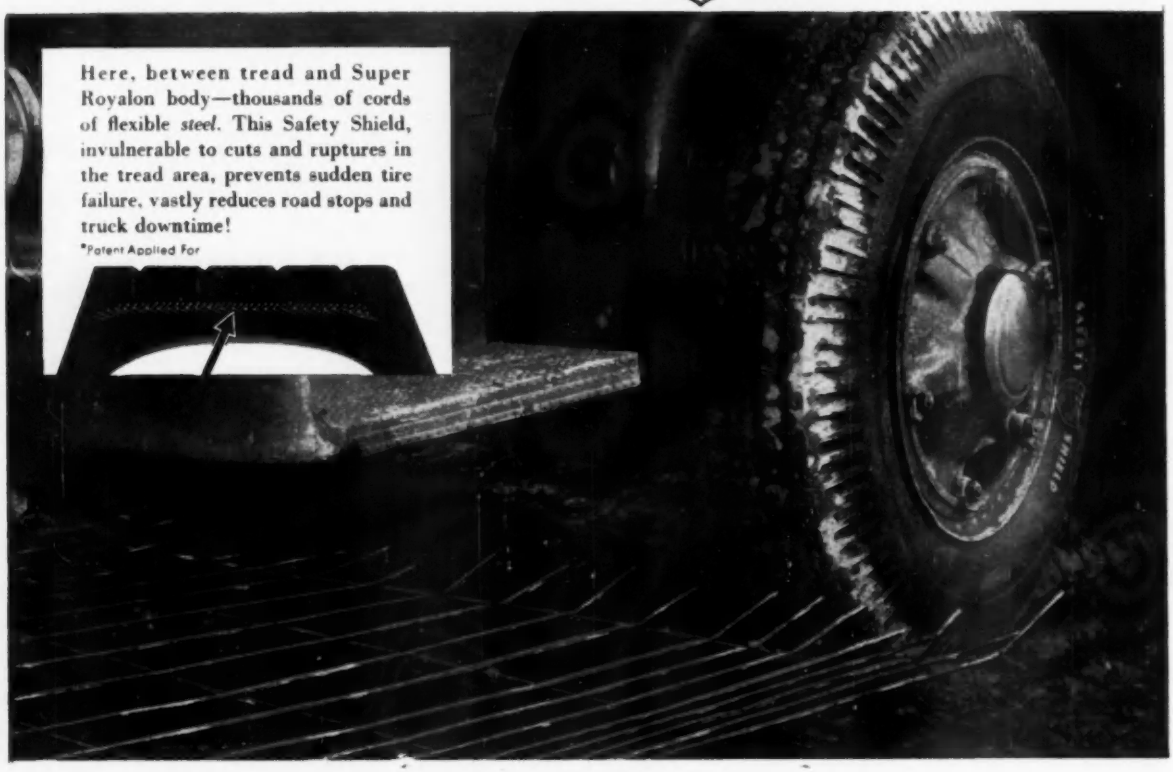
ZOLLNER PISTONS — HEAVY DUTY PISTONS *by* ZOLLNER

FOR RECONDITIONING *ALWAYS SPECIFY THE* "ENGINEER APPROVED" PISTON

ZOLLNER CORPORATION • FORT WAYNE, INDIANA

STOP Cuts, Ruptures, Delays

with exclusive SAFETY STEEL SHIELD*



U.S. ROYAL ...world's strongest, longest-wearing tires

Here's the strength of *steel* combined with light weight and soft ride—without increased inflation. Here's new protection for drivers, trucks, loads... new insurance against tire failures and road delays.

And here's the *most economical* of truck tires. Because this U. S. Royal with Safety Steel Shield stops tread cuts from penetrating to the cord body (75% of your tire investment), it stays "like new" for extra recaps.

Get the full story of this great new U. S. Royal, now priced right with ordinary tires. Call your U. S. Royal Dealer today! ***Of course you can specify U. S. Royals with Safety Steel Shield on the new equipment you buy!***

Also available in these "Life-Seal"

TUBELESS U. S. ROYALS

- U. S. ROYAL FLEETWAY —for all-around use on the highway
- U. S. ROYAL Super FLEETMASTER —the all-wheel, on-and-off-the-road tire

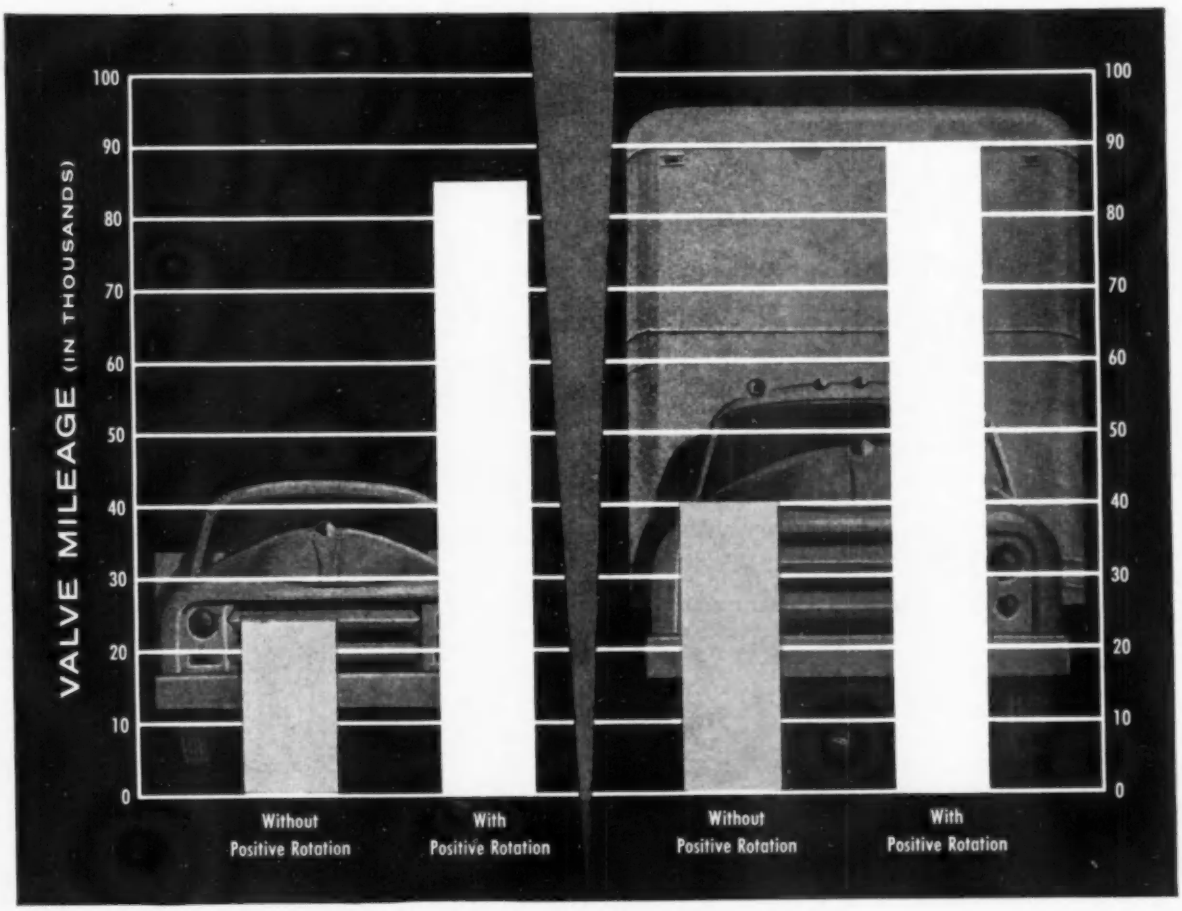
US RUBBER

United States Rubber

Rockefeller Center, New York 20, N. Y. • In Canada: Dominion Rubber Co., Ltd.

See things you never saw before. Visit U. S. Rubber's new Exhibit Hall, Rockefeller Center, N. Y.

VALVE MILEAGE (IN THOUSANDS)



Better performance from any size engine with Thompson Positive Valve Rotation

Big, heavy-duty engines cost less to run when Thompson positive-rotation systems are on the valves.

And so do the smaller engines . . . for pick-ups and panel trucks!

All engines turn in more hours of economical operation at lower fuel costs when one of the Thompson-developed systems of positive rotation gives valves a regular, measured amount of rotation on every stroke. Danger of valve burning and sticking is greatly reduced, stem wear is equalized, compression is maintained thousands of miles longer.

Have the benefits of Thompson positive-valve rotation as original equipment on your next truck engines, whatever their horsepower or duty requirements.

Valve Division ***Thompson Products, Inc.***

1455 EAST 185th STREET • CLEVELAND 10, OHIO

The Big Fleets buy

Why? . . . because on-the-job performance and low operating costs prove FORD trucks cost less

Take a tip from the men who buy trucks every year. Official truck registration data for the past two years show that owners of America's biggest commercial fleets have bought more Ford trucks than any other make!

Commercial fleet operators, large and small, have found Ford trucks are best for their fleets, too. To begin with, Ford's initial costs are low. Many models are priced below all competitive makes. For example, the new Ford Tilt Cab models are America's lowest-priced!* And it costs less to run a Ford truck! Thanks to modern Short Stroke power and sturdy chassis construction, operating costs and "shop time" are reduced. Another important Ford plus is longer truck life —a fact certified by independent insurance experts.

Contact your Ford Dealer . . . let him show you why the big fleets are buying more Ford trucks than any other make.

*Based on comparison of manufacturers' suggested retail prices

New Ford Medium Duty trucks have higher horsepower and more rugged chassis construction. Your choice of three modern Short Stroke engines—V-8 or Six.

Representative Common Carriers that have picked Ford Trucks for their fleets

BELGER CARTAGE SERVICE, INC.
Kansas City, Missouri

THE CLEVELAND CARTAGE COMPANY
Cleveland, Ohio

NORTH AMERICAN VAN LINES, INC.
Fort Wayne, Indiana

THE ADLEY EXPRESS COMPANY
New Haven, Connecticut

STANDARD MOTOR FREIGHT, INC.
Pittsburgh, Pennsylvania

FOLLMER TRUCKING COMPANY
Danville, Pennsylvania

MERCHANTS MOTOR FREIGHT, INC.
St. Paul, Minnesota

CANTLAY & TANZOLA, INC.
Western Truck Lines, Ltd.
Los Angeles, California

COMMERCIAL MOTOR FREIGHT, INC.
Columbus, Ohio

PATTERSON TRANSFER COMPANY
Memphis, Tennessee

O. K. TRANSFER CO., INC.
Kansas City, Kansas

WEICKER TSF & STORAGE COMPANY
Denver, Colorado

D. E. THOMPSON TRUCKING CO.
Atlanta, Georgia

STAR TRANSFER LINE
Grand Rapids, Michigan

more FORD TRUCKS than any other make!

New Tilt Cab line offers six series from 18,000-lb. GVW to 60,000-lb. GCW. All the advantages of "cab forward" compactness, plus better engine accessibility.

FORD TRUCKS COST LESS

LESS TO OWN — LESS TO RUN — LAST LONGER, TOO!

Contractor's Base Shop Methods

Continued from Page 84

it takes out of it. If we had a set period for overhauls we would be over-servicing, since we have many engines that have operated five years and are still in good condition. Yet we don't plan on operating to breakdown. We try to judge from maintenance reports and the history of the unit whether it is practical from a profit standpoint to run a unit or rebuild it."

Everybody watches for leaks—oil, water or hydraulic fluid—because leaks mean waste and often indicate that other service is necessary. Much of the field service work consists of repairing leaks by the installation of new seals, new hose clamps, new hose, repairing oil lines, and replacing gaskets.

Field Overhaul Sometimes

Virgil Lilligard is far removed from an office superintendent. He is on the jobs constantly, drives a panel truck loaded down with tools, cabinets and drawers full of brass tube fittings, tubing, clamps, hose, seals and springs. One cabinet contains more bolts from ¼-in. up than most hardware stores stock. These supplies are issued on almost every job he visits.

Field overhauls are only scheduled when the expense of moving the machine to the shop and replacing it with another unit would be too great for the cost involved in doing it where it stands.

Base Shop

The base shop and parts department is a large, roomy building. Equipment is complete for the overhaul and repair of all equipment. Jobs are finished even to new paint.

Accessories are passed through reconditioning in the shop as a regular thing and when completed are wrapped in plastic or have their openings sealed and placed in stock.

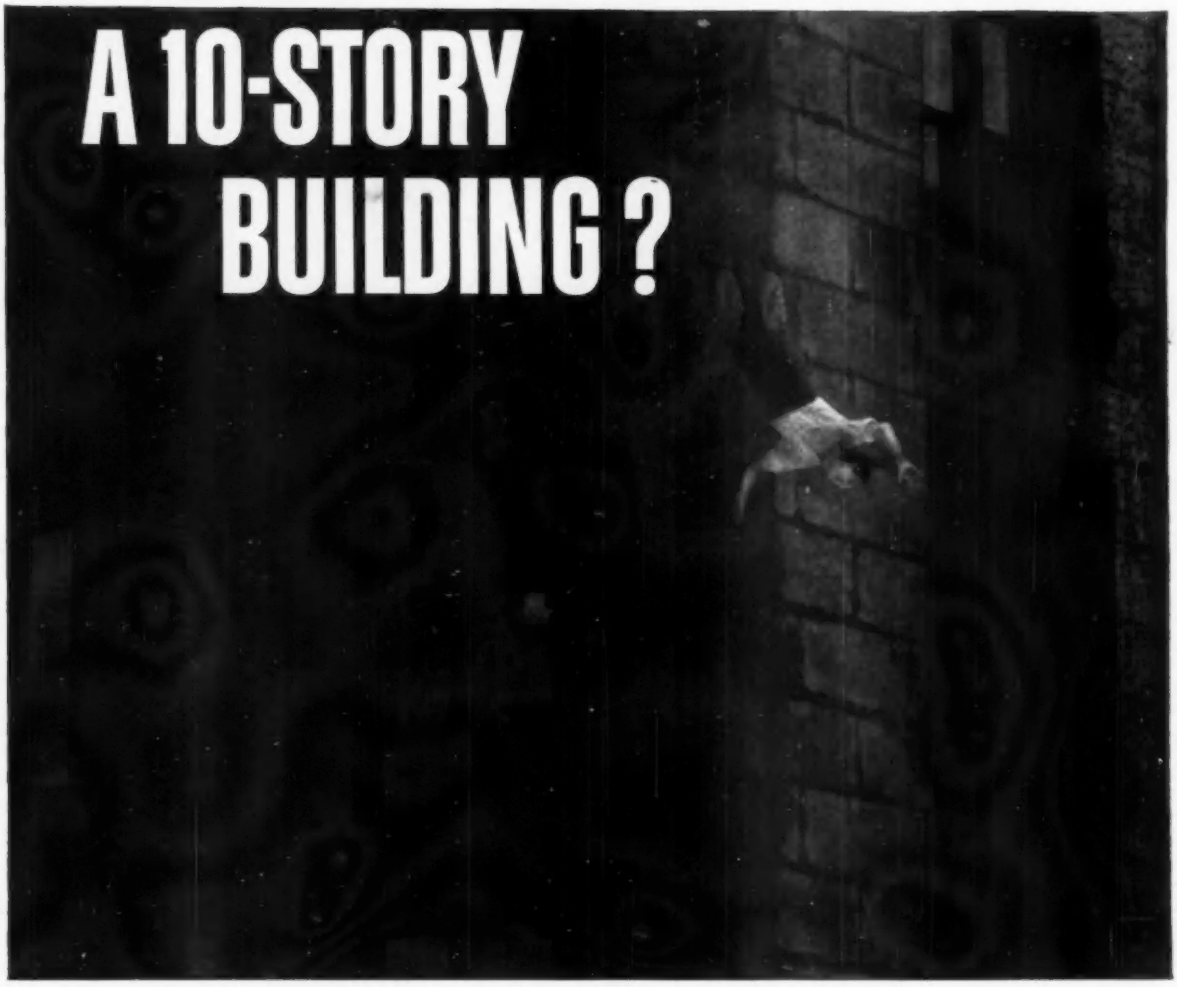
They built their own injector stand and regularly service all the injectors used in the several different kinds of diesel engines. Torque converters, the bugaboo of some field shops and puzzles to some base shops, are regularly overhauled here. Complete testing and gaging facilities have been developed to such a stage that a large torque converter can be overhauled in five hours as against 12 hours for an automatic in a passenger automobile in most service departments.

Shop Procedures

Some indication of the scope of the work is shown in the rebuilding of extra hydraulic steering jacks for dirt-moving scrapers, extra blowers and starters for engines, brake bands. Rebuilt final drives are on hand and such items

(TURN TO PAGE 134, PLEASE)

EVER JUMP OFF A 10-STORY BUILDING?



Your Drivers Do It Every Day

With a Bostrom "Level-Ride" 80 Seat road shock and vibration are absorbed between the seats and the floor of the cab. You float smoothly over bumps and jolts.

During an average working day truck drivers riding on conventional seats absorb shock and vibration equal to the impact of a fall from a 10-story building!

This kidney-busting, spine-pounding shock means tired, inefficient drivers whose life spans are shortened and who are so "beat up" after a few years that their ability to drive a truck is impaired.

A Bostrom "Level-Ride" 80 Suspension Seat changes all that. Shock and vibration are absorbed between the bottom of the seat and the floor of the cab . . . the driver and seat float over bumps and jolts in a straight line without back slap or back rub.

Used today by leading truck fleets . . . factory installed as optional equipment by all truck manufacturers. Available for replacement on your existing trucks from your truck dealer or parts jobber. See your Bostrom Distributor. Bostrom Manufacturing Company 133 West Oregon Street, Milwaukee 4, Wis.

BOSTROM

FREE MOTION PICTURE IN SOUND AND COLOR "Gentlemen, Be Seated," an informative motion picture on modern highway travel, is available without charge for showing to groups. Write for booking date.

bigger profits for liquid transporters

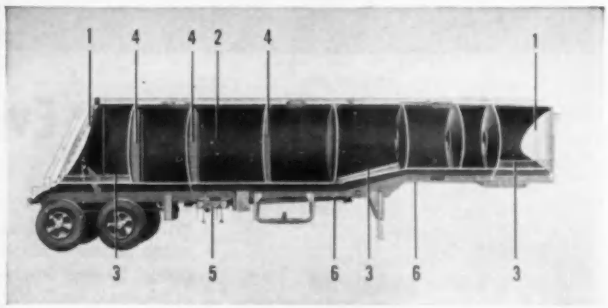
ALUMINUM Fruehaufs for petro-chemicals, gasoline, and hundreds of other commodities. Sturdy, lightweight construction provides *extra* payloads up to 800 gallons!

THE HIGHLY SPECIALIZED SCIENCE of bulk liquid transport has reached a stage where it's no longer economically sound to buy a Tank-Trailer without careful attention to every minute detail and engineering specification.

Legal limitations, stress problems, temperature control, payload increases, compartmentalization for utmost versatility, and the reputation of the manufacturer in the matter of such an expensive piece of equipment are but a few factors to watch in tank purchases today.

Fruehauf has the hauling industry's largest staff of Tank-Trailer engineering experts to help you deal *correctly and profitably* with these problems. The standard line of Fruehauf aluminum, steel, and stainless steel bulk transports is the largest in the industry — but in addition, only Fruehauf is staffed and equipped to furnish you with *any* specialized tank for *any* bulk or liquid commodity.

HI-TENSILE STEEL Fruehaufs for gasoline and countless other hauls. Perfect hydraulic design provides unique shell strength and utmost resistance to stress and fatigue.



"Hidden" Values In Fruehauf Aluminum Tanks

1. Tensile strength of 34,000 psi at welds
2. New automatic welding system for perfect uniformity
3. Reinforced heads over underconstruction, drop, and coupler
4. Aluminum channel head braces on all bulkheads and baffles
5. Wide range of manifold equipment available
6. Outriggers mounted to vessel with pads
7. 8,250 gallon, 3-compartment unit weighs only 8,300 lbs.

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FRUEHAUF TRAILERS

"ENGINEERED TRANSPORTATION"

TIME and TIME AGAIN the GRAND SLAM!*

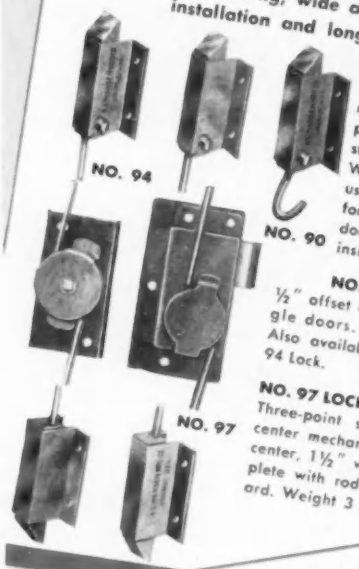
HANSEN

Stands Up Under the Constant Pounding and Brutal Shocks of Daily Use

* **As a Grand Slam wins at bridge, HANSEN has the winning combination of Slamming Locks.**

HANSEN SLAMMING LOCKS

Quick slamming, wide adaptability, easy installation and long durability.



NO. 94

NO. 90

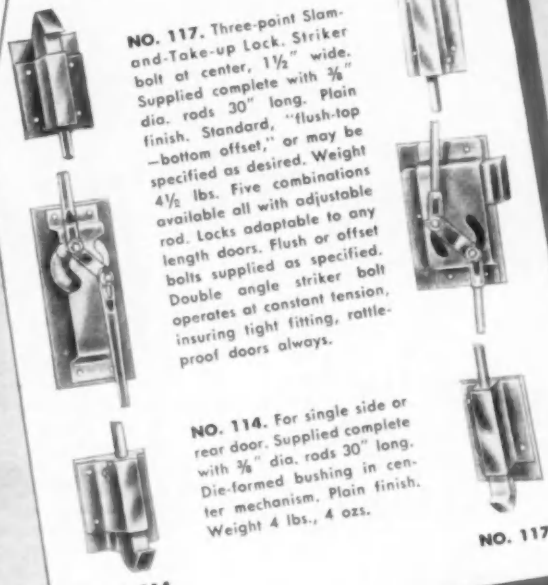
NO. 97

NO. 94 LOCK. ½" offset or flush. For single side or rear door. Supplied complete with rods 26" long, standard. Weight: 2½ lbs. Where double doors are used, similar lock available for second door. On double door, lock available with inside handle.

NO. 90 LOCK with Hook. ½" offset or flush. For small single doors. Opens from inside. Also available for use with No. 94 Lock.

NO. 97 LOCK. ½" offset or flush. Three-point slamming lock with center mechanism. Striker bolt at center, 1½" wide, supplied complete with rods 26" long, standard. Weight 3 lbs. 11 ozs.

HANSEN HEAVY-DUTY SLAM-AND-TAKE-UP LOCKS



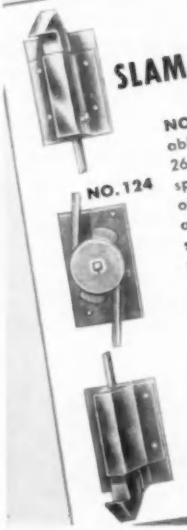
NO. 114

NO. 117

NO. 117. Three-point Slam-and-Take-up Lock. Striker bolt at center, 1½" wide. Supplied complete with ⅜" dia. rods 30" long. Plain finish. Standard, "flush-top—bottom offset," or may be specified as desired. Weight 4½ lbs. Five combinations available all with adjustable rod. Locks adaptable to any length doors. Flush or offset bolts supplied as specified. Double angle striker bolt operates at constant tension, insuring tight fitting, rattle-proof doors always.

NO. 114. For single side or rear door. Supplied complete with ⅜" dia. rods 30" long. Die-formed bushing in center mechanism. Plain finish. Weight 4 lbs., 4 ozs.

HANSEN SLAM-AND-TAKE-UP LOCKS



NO. 124

NO. 120

NO. 124 LOCK. Weight 2½ lbs. Adaptable to side or rear doors. Complete with 26" rods. Flush or offset striker bolts as specified. Standard, top flush, bottom offset. Constructed for easy slamming and positive take-up. Flush and ½" offset striker bolt cases may be secured in any combination.

NO. 120 LOCK WITH HOOK. Weight ¾ lb. Opens from inside of door. Used on left-hand rear doors, tool boxes, tail gates, etc. Also as part of the No. 124 Rotary Door Lock. Flush standard, offset if specified.

HANSEN HARDWARE for Commercial Bodies

Whatever your locking need is, HANSEN can supply the answer.

Write for complete detailed FREE catalog.

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CHICAGO 40, ILLINOIS

STOP with

DELCO LINED BRAKE SHOES
Made and assembled to original equipment specifications.

WHEEL CYLINDER REPAIR KIT
All parts necessary to put wheel cylinder in normal operating condition.

MASTER CYLINDER REPAIR KIT
All parts needed to put master cylinder in normal operating condition.

Delco Super 11 brake fluid improved with HTD—original equipment in General Motors cars and trucks—is efficient at 50° higher temperatures, improves braking at all temperatures, under all operating conditions. Chemically stable, compatible with the rubber and metal parts in the brake system—and with greater resistance to corrosion and evaporation—Delco Super 11 *exceeds* all S. A. E. and government specifications for heavy-duty hydraulic brake fluid. Do yourself a favor—order Delco Super 11 improved with HTD *today!* Packed in convenient containers, from pint cans to 54-gallon drums. Available everywhere through the United Motors System or your General Motors car or truck dealer.

General Motors Values from

Moraine Products

Division of General Motors, Dayton, Ohio

Firestone Announces

A New Lightweight Truck Rim

at a NEW LOW PRICE!

The New Firestone "CHALLENGER" Two-Piece Rim

All These Features:

★ **Weight-Saving...**
Lightweight, but extra rugged. No dead weight . . . You get extra payload because they're 8% to 12% lighter than most standard rims.

★ **Easier to Mount and Demount...**
New simplified construction . . . only one piece to remove when changing tires. Beads loosen easier. A real time-saver.

★ **Approved Spacing between Duals...**
No sacrifice of center to center spacing on duals . . . meets requirements of tire and rim association. Can be used with chains.

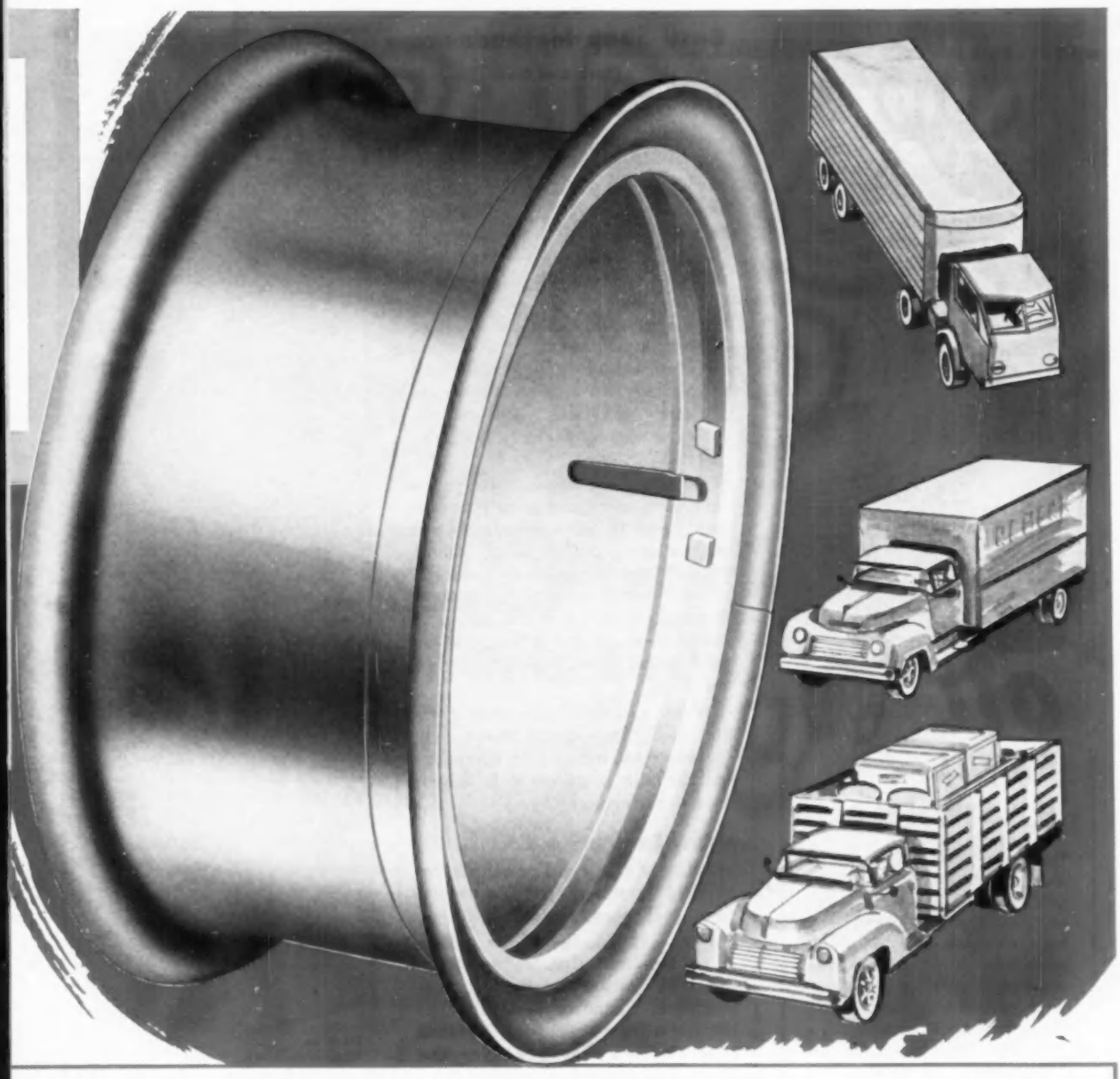
★ **Strength Where You Need It...**
Engineered for extra strength . . . reinforced at high stress points. Tested and proved in the lab and on the road.

★ **Money-Saving Low Price...**
Nothing compromised but the price. No other rim offers so much value . . . it's the lowest-priced quality rim on the market today.

THIS GREAT NEW RIM AVAILABLE THROUGH

Akron 7, Ohio—The Motor Rim Manufacturers Co.
Albany 1, N. Y.—Wheels, Incorporated
Albuquerque, New Mexico—Wheels & Brakes, Inc.
Atlanta 3, Ga.—John A. Harris & Son, Inc.
Baltimore 3, Md.—R. W. Norris & Sons, Inc.
Baltimore 25, Md.—Standard Wheel & Rim Co.
Birmingham 3, Ala.—Wheel, Rim & Parts Co.
Boston 15, Mass.—New England Wheel & Rim Co.
Buffalo 3, N. Y.—Frey, The Wheelman, Inc.
Cedar Rapids, Ia.—Des Moines Wheel & Rim Co.
Charlotte 1, N. C.—Carolina Rim & Wheel Co.
Chicago 16, Ill.—Stone Wheel & Rim Co.
Cincinnati 3, Ohio—Rim & Wheel Service, Inc.
Cleveland 1, Ohio—The Motor Rim Mfrs. Co.
Clifton, N. J.—Wheels, Incorporated
Columbus 15, Ohio—Hayes Wheel & Spring Service
Dallas 2, Texas—Southwest Wheel, Inc.
Davenport, Iowa—Stone Wheel & Rim Co.
Dayton 2, Ohio—Rim & Wheel Service, Inc.
Denver 1, Colo.—Quinn & McGill Motor Supply
Des Moines 12, Iowa—Des Moines Wheel & Rim Co.
Detroit 8, Mich.—H & H Wheel Service, Inc.
Detroit 2, Mich.—Rim & Wheel Service Co.
Evansville, Ind.—Auto Wheel & Rim Service Co.
Fargo, N. Dakota—Wheel Service Co.
Fargo, N. Dakota—Pioneer Rim & Wheel Co.
Fort Wayne, Ind.—Wheel & Rim Sales Co.
Grand Rapids 2, Mich.—Rim & Wheel Service Co.
Harrisburg, Pa.—Standard Wheel & Rim Co.
Hartford 6, Conn.—Connecticut Wheel & Rim Co.
Houston 2, Texas—Southwest Wheel, Inc.
Indianapolis 2, Ind.—Indiana Wheel & Rim Co., Inc.
Jacksonville, Fla.—Southeast Wheel & Rim Co.
Kansas City, Mo.—Borbein, Young & Co.
Knoxville 17, Tenn.—John A. Harris & Son, Inc.
Lancaster, Pa.—Standard Wheel & Rim Co.
Los Angeles 23, Calif.—Motor Rim & Wheel Service
Los Angeles 58, Calif.—Wheel Industries, Inc.
Louisville 3, Ky.—Auto Wheel & Rim Service Co.
Lubbock, Texas—Southwest Wheel, Inc.
Memphis 3, Tenn.—Beller Wheel, Brake & Supply
Milwaukee 13, Wisc.—Aring Equipment Co., Inc.
Minneapolis 4, Minn.—Pioneer Rim & Wheel Co.

FIRESTONE STEEL PRODUCTS



THESE OUTSTANDING RIM DISTRIBUTORS...

Nashville 3, Tenn.—Beller Wheel, Brake & Supply
New Haven 11, Conn.—Connecticut Wheel & Rim Co.
New Orleans 19, La.—Southern Wheel & Rim Service
New York 23, N. Y.—Wheels, Incorporated
Oklahoma City 1, Okla.—Southwest Wheel, Inc.
Omaha 2, Neb.—Morgan Wheel & Equipment Co.
Omaha 2, Nebraska—Omaha Rim & Wheel Co.
Peoria 2, Ill.—Peoria Wheel & Rim Co.
Philadelphia 4, Pa.—Kay Wheel Sales Co.
Philadelphia 30, Pa.—Thomas Wheel & Rim Co., Inc.
Pittsburgh 13, Pa.—Wheel & Rim Sales Co.
Portland 9, Oregon—Auto Wheel Service
Portland 14, Oregon—Six Robblees', Inc.
Providence 3, R. I.—New England Wheel & Rim Co.
Raleigh, N. C.—Carolina Rim & Wheel Co.
Richmond 20, Va.—Dixie Wheel Company
Rochester 7, N. Y.—Frey, The Wheelman, Inc.
St. Louis 8, Mo.—Borbein, Young & Co.
St. Paul 4, Minn.—Wheel Service Co.
Salt Lake City 1, Utah—Henderson Rim & Wheel Service
San Antonio 2, Texas—Southwest Wheel, Inc.
San Francisco 10, Calif.—Motor Rim & Wheel Service
San Francisco 3, Calif.—Wheel Industries, Inc.
Seattle 22, Wash.—Motor Wheel & Parts Co., Inc.
Seattle 14, Wash.—Six Robblees', Inc.
South Bend 18, Ind.—Wheel & Rim Sales Co.
Spokane 2, Wash.—Bearing & Rim Supply Co.
Springfield, Mo.—Borbein, Young & Co.
Springfield, Ill.—Illinois Wheel & Brake Co.
Syracuse 1, N. Y.—Wheels, Incorporated
Tacoma 3, Wash.—Six Robblees', Inc.
Toledo 2, Ohio—Wheel & Rim Sales Co.
Wichita 5, Kansas—Borbein, Young & Co.

CANADIAN DISTRIBUTORS

Calgary, Alberta—Fisk Tire Service Co., Ltd.
Edmonton, Alberta—Alberta Wheel Distrib., Ltd.
Edmonton, Alberta—Clark's Service Garage
Montreal 34, Quebec—Auto Wheel & Supplies, Ltd.
Regina, Sask.—Brakes & Wheels, Ltd.
Toronto 1, Ontario—Harpham Brothers
Vancouver 10, B. C.—Wheels & Equipment, Ltd.
Winnipeg, Manitoba—Fort Garry Tire & Serv. Co.

COMPANY • AKRON, OHIO

Base Shop Methods

Continued from Page 126

as hydraulic valves are reseated and resealed and placed in stock.

They do not build up rails on crawler tracks as is widely done in the industry or track pins and bushings. Such replacements are made with new parts when necessary. Lilligard said it was the more economical way since a broken rail usually indicated a bad track and unless a unit is properly repaired it will generate a series of costly breakdowns. Spare tracks and idlers are kept in stock.

Ordinary rebuilt accessories go into parts stock and rebuilt equipment goes to the equipment yard with a new coat of paint. About 20 men are employed in the shop in the winter months when construction is at a low ebb. Many of these men go into the field as mechanics when construction opens up.

When a contract has been completed, the equipment comes back to the base. Here it is inspected and usually some of it is scheduled for overhaul.

Money Savers

Many of the repair methods developed in the shop have proved to be real money savers.

For example, they have a fleet of rubber-tired dirt-moving scrapers with torque converter transmissions. Under certain job conditions when the scraper operated up a hill and plunged over the crest, the 20-yard load had a tendency to bump the converter as the load runs faster than the engine. This has resulted in breaking the hardened steel ring or cage that houses the over-riding clutch. This does not put the scraper out of commission immediately but it limits the retarder action and makes the wear on brakes excessive, so they are taken out as quickly as possible and a rebuilt converter installed.

The conventional repair cost on such a torque converter is $325. If the damage is not too great they may be exchanged for $221

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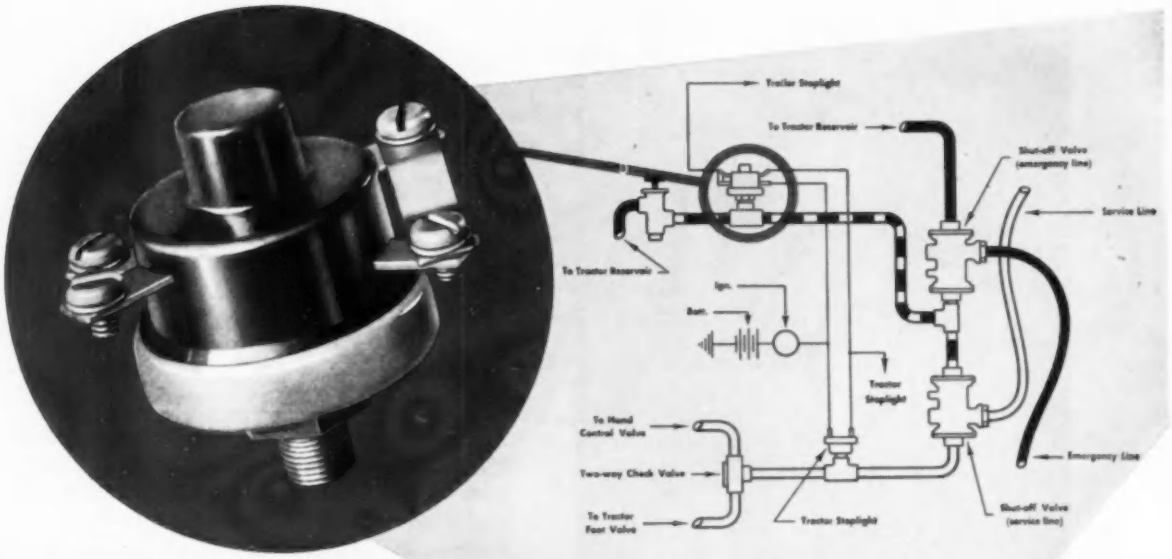


MIDLAND'S Trailer Emergency Stoplight Switch Is Your Answer To ICC Requirements

YOU WILL CONFORM to the ICC's emergency braking stoplight requirement for combination vehicles quickly, effectively, economically by equipping your tractor units with Midland's newly perfected double throw stoplight switch—the switch designed to actuate the trailer stoplight when the brakes are applied by emergency controls.

This switch operates in conjunction with the standard stoplight switch currently installed in vehicles equipped with air brakes. Whereas the standard switch is operated by pressuring the service line, Midland's new emergency stoplight switch goes into action when an emergency application is made and pressure is exhausted from the emergency line.

The new switch can be installed very simply, requires very little change in piping and wiring. For full details, contact your nearest Midland Distributor — or write the factory direct.

Also available — Midland's new vacuum suspended stoplight switch, which provides trailer stoplight actuation on combinations equipped with vacuum brake systems . . . It is simple in construction, dependable in operation. Durable yet compact, it can be installed easily and economically . . . It's a fact—Midland has the most *complete* line of tractor and trailer braking equipment in the industry!

MIDLAND
STEEL PRODUCTS CO.

THE MIDLAND STEEL PRODUCTS COMPANY

OWOSSO DIVISION • OWOSSO, MICHIGAN

Export Department: 38 Pearl Street, New York, N. Y.

Reed I. West, president and owner of Cochrane Transportation Company, Richmond, Virginia, praises Lo-Level's functional capacity.

"Our shippers asking

According to President Reed West, owner of the Cochrane Transportation Company, "Shippers are very much aware of Lo-Level and the many advantages inherent in this new high volume, straight floor design. And with good reason!

"Drop frames impose serious loading problems for our customers. Take cigarettes, for example. To avoid carton overhang, they either have to lose space in front of the drop or bridge behind it. Or, take linoleum packed in tubes. Here again, they have to waste

are
for 'those big straight frames'

. . . and they mean Trailmobile LO-LEVELS"

valuable space by bridging behind the drop in order to prevent bending or breaking. In either case, they lose space and loading time . . . and often the services of the extra man needed to help load the nose.

"With Lo-Levels, all these problems are eliminated. The straight floor and uniform loading height allow for faster, easier loading and provide extra capacity *that can be used*. From both the customer viewpoint and ours, Lo-Levels mean more efficient, profitable shipping."

"No more load engineering"

"Here's another thing we like about Lo-Levels. Fork lifts can run right up to the front. There's no more double handling . . . no more load 'engineering' or juggling of cargo, which we often have to do in drop frames.

"And, the uniform loading height—98½" from front to rear—gives us, in many cases, an extra layer of cargo the full length of the trailer."

TR-620

CID LO-LEVEL

*Customer Individualized Design

TRAILMOBILE INC.

Cincinnati 9, Ohio • Berkeley 10, Calif. • Springfield, Missouri

Longview, Texas

Dairy company's records prove Gates "T" Belts cost less per mile

TPA 258

"According to actual records covering many years, we know Gates T" Belts save us money in two ways—in their lower cost per mile, and in the almost total elimination of road delays due to belt failures."

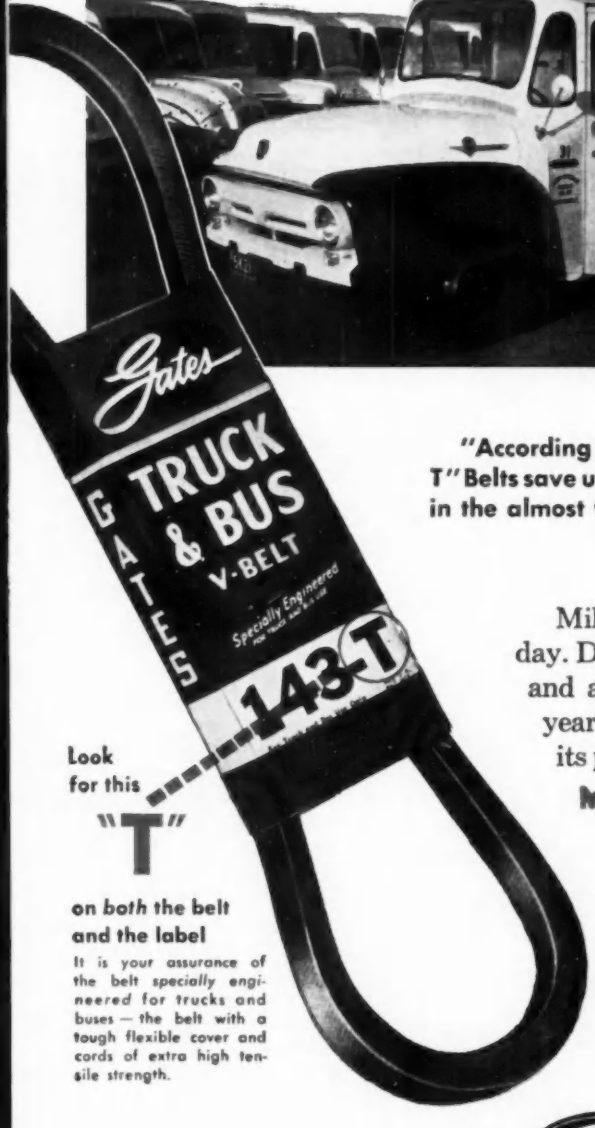
FRANK WILSON, *Maintenance Manager*
The Coors Bros. Co., Cincinnati, Ohio

Milk deliveries *must* be made on schedule, day after day. Delays along the routes can seriously upset schedules and affect customer relations. That's why Coors many years ago standardized on Gates "T" Belts as a part of its preventive maintenance program.

Make this test

Call your nearby Gates jobber and have a Gates Belt Specialist deliver a trial order of belts for your own on-the-job comparison test. Match the service life and cost-per-mile of Gates "T" Belts against any you have ever used.

The Gates Rubber Co., Denver, Colorado



Look for this "T" on *both* the belt and the label

It is your assurance of the belt *specially engineered* for trucks and buses — the belt with a tough flexible cover and cords of extra high tensile strength.

World's Largest Maker of V-Belts — Gates — The Mark of *Specialized* Research

GATES TRUCK & BUS V-BELTS

From left—J. F. Sneberger, research & eng'g director, Spector Freight System, Chicago. W. W. Wolfe, Watson Bros. Trans., new president of Nebr. Motor Carrier Assn. R. S. Moore, Los Angeles-Seattle Motor Express, new chairman of American Trucking Assns. Committee of 100

Base Shop Methods

Continued from Page 134

but usually the higher figure prevails. The hardened steel ring is not available. These are of hardened steel about three inches in diameter and Lillegard has had them made in an area machine shop and hardened. He has had some of them running for three years without breaking. This repair is made at a cost of $65, a direct saving of $260.

Modify Sprocket Rims

Another job that is relatively new to the industry is the replacement of sprocket rims on crawler tractors with a home-cast rim. A study was made of the cost of hard-facing worn sprockets. Roughly, it took a week to build up a wheel, the time of the welder and the expense of operating the welding equipment and 75 to 100 lb of hard-facing rod.

Lillegard brought in an expert pattern maker and had him make a study of the sprocket rim. He pointed out points of greatest wear and had these points made heavier. The result was a rim cast in an area foundry, wider and heavier than the original and with short flanges inside the sprocket rim for welding to the cut-off spokes of the original hub. The old rim is cut off with a torch and the new rim is welded to the spokes in a jig which was made in the shop.

Results over the last few years show that these sprockets give 40 per cent more wear than original equipment and the cost picture is equally attractive. A new wheel or an average sized crawler sells for $360. The new rim and the welding time for restoring the wheel costs $115, a direct saving of $245 in cash and $144 in extra wear. Recently one of the tractor manufacturers started furnishing a cast-iron replacement rim to be used in the same manner.

Upgrade Scrapers

Another interesting and money-saving repair operation was the

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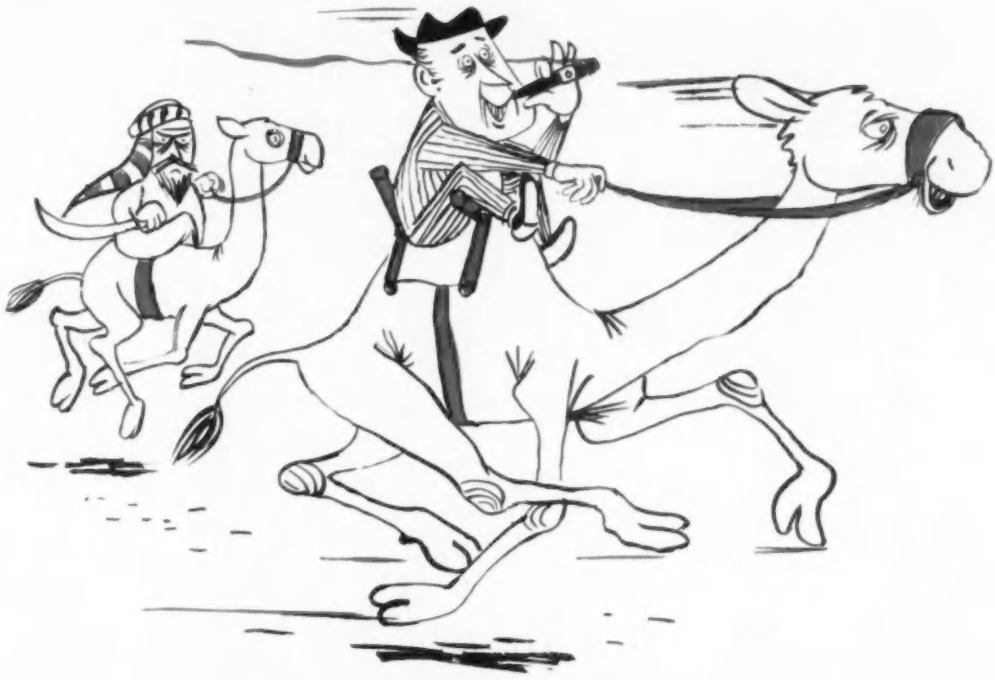


no matter what kind of fleet you operate...

FORMFLEX CHROME RING SETS

are your key to power and economy

Pedrick's exclusive "Equalizer" makes possible a ring of the utmost conformability to all cylinder conditions because it provides uniform distribution of ring pressure.

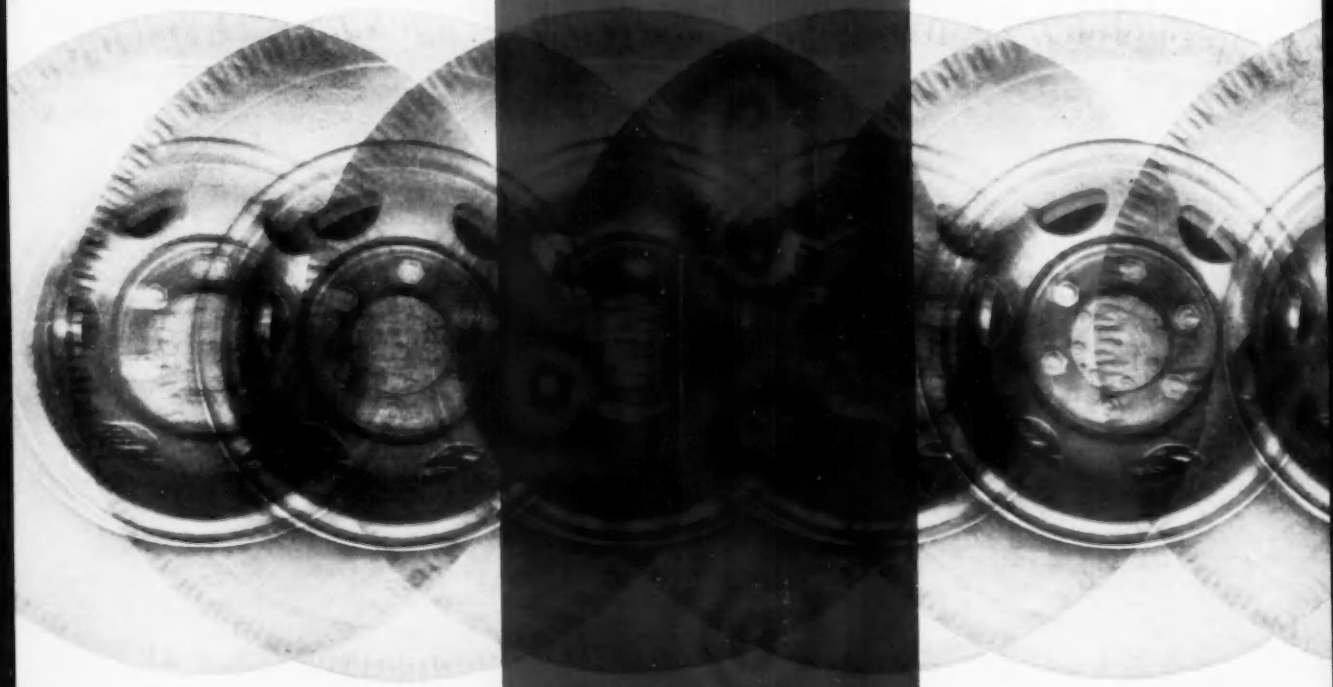
This means a more perfect seal against both blow-by and oil waste while preserving essential lubrication.

The results are maximum power, economy of fuel and oil, less wear, and an effective life made 2 to 4 times longer because the top compression ring as well as the oil-ring rails are faced with solid CHROME.

IT PAYS TO INSTALL PEDRICK FORMFLEX CHROME RINGS!

WILKENING MANUFACTURING CO., Philadelphia 42 and Toronto 2

ROLLING...COAST TO



NATIONWIDE SERVICE

AKRON—Motor Rim Manufacturers Co.
ALBANY—Wheels, Incorporated
ALBUQUERQUE—Wheels & Brakes, Inc.
ATLANTA—John A. Harris & Son, Inc.
BALTIMORE—Standard Wheel & Rim Co.
BIRMINGHAM—Wheel, Rim & Parts Co.
BOSTON—New England Wheel & Rim Co.
BUFFALO—Frey, the Wheelman, Inc.
CHARLOTTE—Carolina Rim & Wheel Co.
CHICAGO—Stone Wheel, Inc.
CINCINNATI—Rim & Wheel Service, Inc.
CLEVELAND—Motor Rim Manufacturers Co.
COLUMBUS—Hayes Wheel & Spring Service
DALLAS—Southwest Wheel, Inc.
DAVENPORT—Stone Wheel & Rim Co.
DAYTON—Rim & Wheel Service, Inc.

DENVER—Quinn & McGill Motor Supply Co.
DES MOINES—Des Moines Wheel & Rim Co.
DETROIT—H. & H. Wheel Service, Inc.
EVANSVILLE—Auto Wheel & Rim Co., Inc.
FARGO—Wheel Service Company
FORT WAYNE—Wheel & Rim Sales Co.
GRAND RAPIDS—Rim & Wheel Service Co.
HARRISBURG—Standard Wheel & Rim Co.
HARTFORD—Connecticut Wheel & Rim Co.
HOUSTON—Southwest Wheel, Inc.
INDIANAPOLIS—Indiana Wheel & Rim Co.
JACKSONVILLE—Southeast Wheel & Rim Co.
KANSAS CITY—Barbeito, Young & Co.
KNOXVILLE—John A. Harris & Sons, Inc.
LANCASTER—Standard Wheel & Rim Co.
LOS ANGELES—Wheel Industries, Inc.

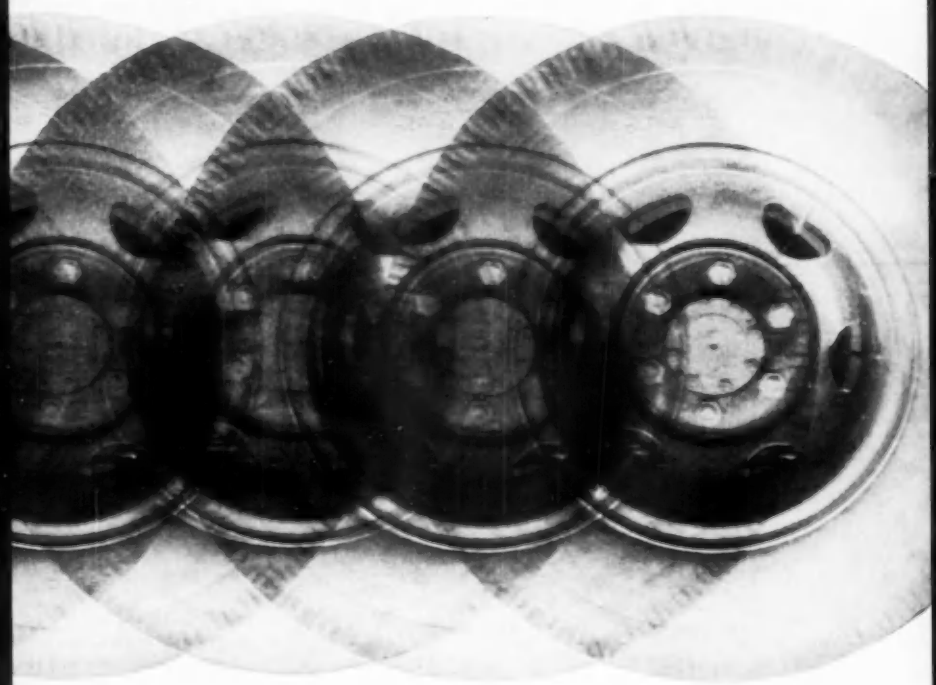
LOUISVILLE—Auto Wheel & Rim Service
LUBBOCK—Southwest Wheel, Inc.
MEMPHIS—Beller Wheel, Brake & Supply Co.
MILWAUKEE—Aring Equipment Co., Inc.
MOLINE—Mutual Wheel Co.
NASHVILLE—Beller Wheel, Brake & Supply Co.
NEWARK—Automotive Safety Inc.
NEW HAVEN—Connecticut Wheel & Rim Co.
NEW ORLEANS—Southern Wheel & Rim Co.
NEW YORK—Wheels, Incorporated
OKLAHOMA CITY—Southwest Wheel, Inc.
OMAHA—Morgan Wheel & Equipment Co., Inc.
OMAHA—Omaha Rim & Wheel Co.
PEORIA—Peoria Wheel & Rim Co.
PHILADELPHIA—Kay Wheel Sales Co.
PHILADELPHIA—Thomas Wheel & Rim Co., Inc.

Budd's low-priced, lightweight, heavy duty steel wheels save time and travel costs for fleet owners throughout the nation. Budd wheels insure less down time, faster and safer trips over all types of roads.

Also, Budd wheels are easily installed; simply "button down" the ball-faced cap nuts. There are no adjusting problems because of Budd's built-in alignment that reduces tire wear; the rim is permanently attached to the disc eliminating "rim creep."

NOTE: Considering tubeless? Budd has a complete line of road-tested economical tubeless wheels which are completely interchangeable with conventional equipment.

The Budd Company, Detroit 15



ST. PAUL—Wheel Service Co.
SYRACUSE—Wheels, Incorporated
TACOMA—Six Robblees', Inc.
TOLEDO—Wheel & Rim Sales Co.
WICHITA—Borbein, Young & Co.
WINSTON-SALEM—United-Automotive Service

EXPORT

CLEVELAND—C. O. Brandes, Inc.

CANADA

CALGARY—Mutual Supplies, Ltd.
EDMONTON—Alberta Wheel Distributors, Ltd.
MONTREAL—Auto Wheels & Supplies, Ltd.
TORONTO—Wheel & Rim Co. of Canada, Ltd.
VANCOUVER—Wheels & Equipment, Ltd.
WINNIPEG—Ft. Garry Tire & Auto Supplies, Ltd.

Budd

Install Spicer ...for service where

MASSIVE construction . . . materials of exceptional durability . . . and efficient design are outstanding Spicer Heavy-Duty Clutch features. Trucks . . . fire apparatus . . . earth movers . . . industrial and railroad applications . . . these giant power-delivery jobs have been handled by Spicer Clutches for over 25 years.

BIG CAPACITY is built into Spicer Clutches with these features:

RELEASE PARTS WITH CLUTCH—The unit is complete with Release Bearing Assembly, Release Yoke and Cross Shafts ready for hookup to pedal linkage. No further engineering or procurement is required by purchaser.

LOWER HEAT ON SPRINGS—There is no direct contact between pressure springs and pressure plate, therefore, springs will not take a set and lose pressure due to heat.

REDUCED FRICTION—The knife edge design of the fulcrum points reduce friction which shows up as less pedal effort to release clutch.

BUILT-IN PARALLELISM—Multiple levers and central springs assure uniform pressure around entire circumference of pressure plate regardless of wear or adjustment.

Su

Ask Da
transm
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50 yea

DANA

AUTOMO
Differentia
Joints, Clu
INDUSTR
Shafts, Ax
AVIATIO
RAILROA
Car Drive
AGRICUL
Take-Off
MARINE
Many of

Super Strength is a Must!

Ask Dana engineers to help meet your particular power transmission requirements. Dana has the clutch experience and the ability to do the job . . . the result of over 50 years of development in power transmission.

DANA CORPORATION • Toledo 1, Ohio

DANA PRODUCTS Serve Many Fields

AUTOMOTIVE: Transmissions, Universal Joints, Propeller Shafts, Axles, Powr-Lok Differentials, Torque Converters, Gear Boxes, Power Take-Offs, Power Take-Off Joints, Clutches, Frames, Forgings, Stampings.

INDUSTRIAL VEHICLES AND EQUIPMENT: Transmissions, Universal Joints, Propeller Shafts, Axles, Gear Boxes, Clutches, Forgings, Stampings

AVIATION: Universal Joints, Propeller Shafts, Axles, Forgings, Gears, Stampings

RAILROAD: Transmissions, Universal Joints, Propeller Shafts, Generator Drives, Rail Car Drives, Pressed Steel Parts, Traction Motor Drives

AGRICULTURE: Universal Joints, Propeller Shafts, Axles, Power Take-Offs, Power Take-Off Joints, Clutches, Forgings, Stampings

MARINE: Universal Joints, Propeller Shafts, Gear Boxes

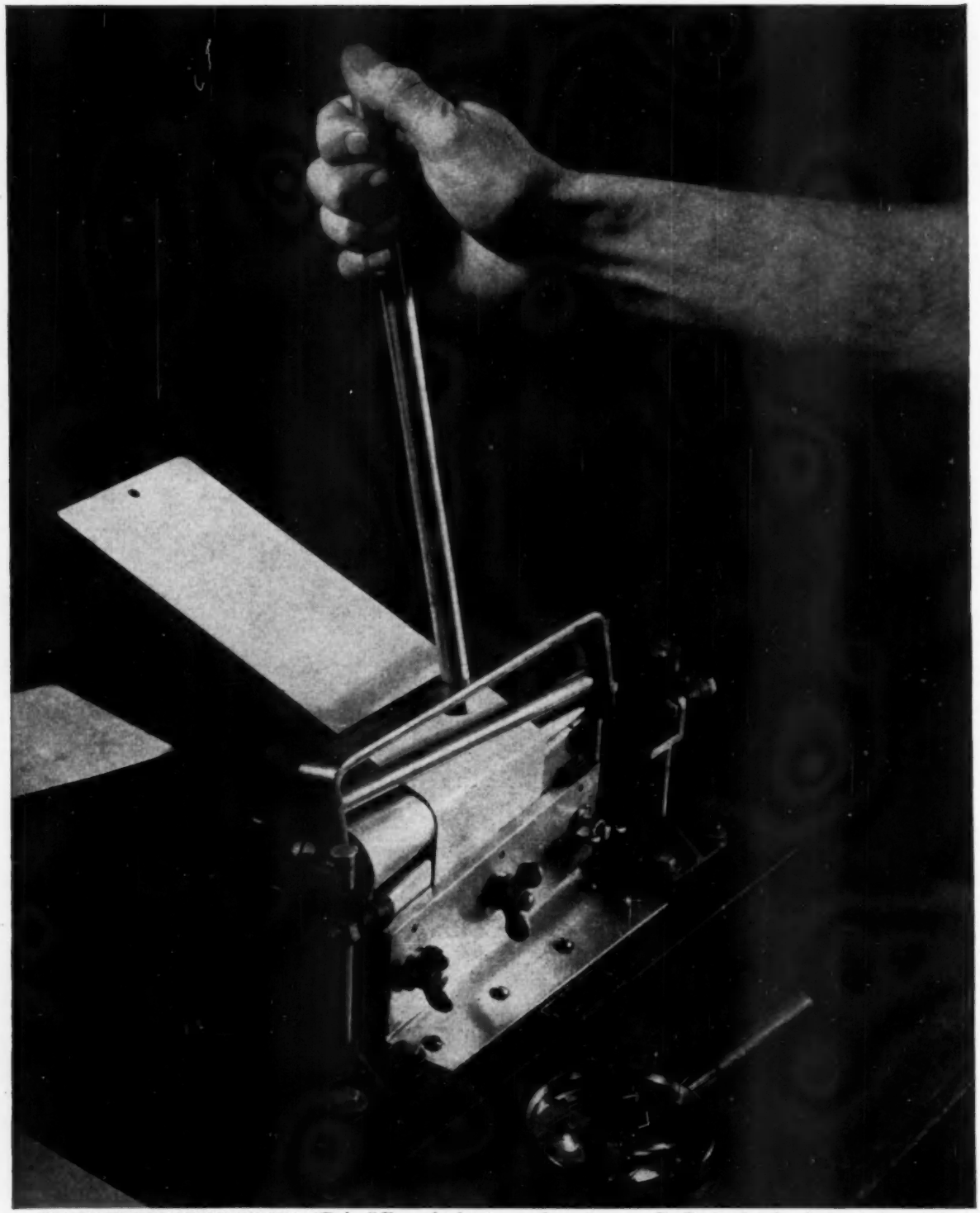
Many of these products manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario

Spicer Clutch Driven Disc Types to Meet Every Need

Damper Type | Riveted Facing Type | Bonded Facing Type | Ceramic Facing Type

DANA Spicer

Bends without cracking—big reason



TOUGH TEST OF FLEXIBILITY—"Dulux" Enamel takes tremendous stress as a Du Pont paint chemist bends the panel in a conical mandrel. Absence of cracking, even at tapered end of cone, shows the outstanding flexibility of "Dulux".

why Du Pont DULUX Enamel is specified by leading fleet operators

Vibration and flexing of body panels while vehicles are in operation are a constant threat to truck and bus finishes. The continuous bending and twisting can easily develop fine cracks clear through to the metal and put units back in the paint shop before their time.

That's why Du Pont uses special *flexible* resins in "Dulux" Enamel and puts it to this severe test. On the conical mandrel (at left) a metal panel finished with "Dulux" shows no cracking even after it's bent into a sharp "L"—worse punishment than your fleet finishes are ever likely to encounter.

AND THIS IS ONLY ONE OF THE TESTS that make "Dulux" the *standard* of durability. Other tests insure resistance to harsh sunlight and dew, to salt air, to chipping under hard knocks, and to ice and heat. Still others measure fast drying, high gloss and all the other features that make "Dulux" popular in the paint shop.

TRUE ECONOMY—When you put Du Pont "Dulux" on your fleet, you take advantage of the continuing experience of the world's greatest paint laboratory. That's why your paint shop will find "Dulux" easy-working and economical . . . why it stays out of the shop and on the road longer.

When you choose a finish to carry your company colors, make sure it will show them at their best. Specify Du Pont "Dulux" Enamel.

IT PAYS TO USE THE COMPLETE "DULUX" SYSTEM

NEW PREP-SOL + NEW PREPAR-AKOTE + DULUX REDUCER + DULUX COLOR

Du Pont "Dulux" Enamel

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

BORDEN'S FARM PRODUCTS TRUCKS make a good impression with sparkling "Dulux" Enamel. And its fresh look "keeps" in any climate—even in grueling day-to-day deliveries in traffic fumes, rain, sunshine and snow.

THE ALBUQUERQUE BUS COMPANY finds "Dulux"-bright buses help sell bus transportation . . . especially likes the way "Dulux" stands up under the blazing New Mexico sun. "Dulux" snaps back bright and beautiful at every washdown.

SITES SILVER WHEEL FREIGHTLINES depends on "Dulux" to keep their fast-growing fleet looking its best on the long haul through the Cascade Mountains and the ice and winds of the Columbia River Gorge.

Base Shop Methods

Continued from Page 140

upgrading of a group of rubber-tired scrapers powered with 300 hp engines, to match newer models, so that one replacement engine would serve as replacement for both the old and new models.

The old model had a 4-cyl gasoline engine starter and the new models had 24-volt electric starters. Gillioz discovered that by removing the starter gear band from the flywheel (it drops off under heat from torch) and turning it over that the teeth slanted the right way for the electric starter gear which was installed on the opposite side from the engine.

The changes were made. The 24-volt battery went nicely into the space occupied by the 4-cyl engine. A starting motor, generator, voltage regulator were added. Only slight modifications of manifolds were necessary and a change in location of the oil filter. Now one stripped engine with openings sealed against dirt replaces both engines and saves more than $2500 in the cost of having a second engine for replacement.

And the 4-Cyl Engines?

But what of the little 4-cyl gas engines they removed? They were all rebuilt and used. One of the best uses was in powering a conveyor belt on a portable rock plant where one of them replaced a smaller and more troublesome engine.

These engines were completely remodeled. Downdraft carburetor was changed to updraft, battery ignition was changed to magneto, battery and starter, generator and voltage regulator was added, as well as a governor. A Chevrolet radiator was used and the whole business set up on steel skids.

END

Please Resume Reading Page 85

Truck's Body Goes . . .

Continued from Page 102

Since all three hydraulic cylinders operate independently from the control panel the body can be tilted either frontward or backward as well as to either side. A rear tire can be changed by simply placing a block under the rear of the body and lowering it until it rests on the block.

Straight truck models are available with 10,000 or 20,000 lb payload capacities. Both are available with 12, 14, or 16 ft body lengths and 6, 7 or 8-ft body heights and conventional or COE cabs. The 20,000 lb model is also available in 18 and 20 ft lengths. The 10,000 lb unit has a 250-300 cu in. V-8 engine, while the 20,000 lb truck uses V-8, 320-400 cu in. power plants.

END

Please Resume Reading Page 104

John Kenska pockets $8 more for every load with New Aluminum Trailer

John J. Kenska, of Elyria, Ohio, has four convincing reasons for buying aluminum dump bodies. Comparison of his aluminum dump trailer with his steel units shows a 16 per cent payload increase that yields $8 more profit per load.

Next, he slashes maintenance costs by $240 a year because aluminum defies corrosive and abrasive attack by coal, slag, lime, cinders and sand. Trips that take six hours with other trailers can be made in five hours with the aluminum unit; 600 hours are saved annually on hauling time. Finally, his state license for the lighter aluminum trailer costs him $59 less than he pays for his steel trailers.

Perfection Steel Body Co., Galion, Ohio, sold John Kenska his aluminum dump body through its Cleveland distributor, Carnegie Body Co. Perfection's use of Alcoa® Aluminum Alloy 5154 cuts empty weight of the 26-foot unit from 13,000 to 9,500 lb. Besides boosting payload, this 3,500-lb reduction cuts fuel costs six per cent traveling empty. Routine washing, the only care required with corrosion-resistant Alcoa Aluminum, takes but an hour — half the time consumed in cleaning other bodies.

When John Kenska tallied up all these moneysaving advantages, he determined to add three more aluminum dump bodies to his fleet. How about you? Thirteen leading manufacturers are ready to fill your requirements. Get their names by writing today to: Aluminum Company of America, 1876-G Alcoa Building, Pittsburgh 19, Pennsylvania.

THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

WE CHOSE ALCOA ALUMINUM MILL PRODUCTS
ALUMINUM COMPANY OF AMERICA
ALCOA

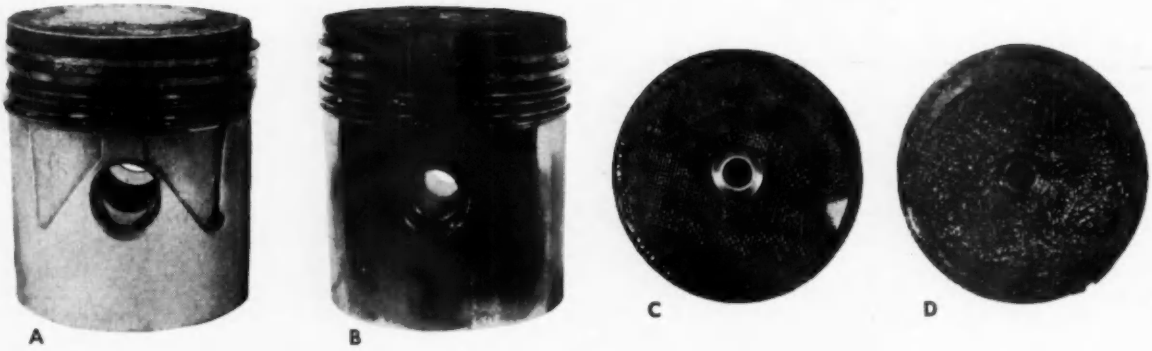
Your Guide to the Best in Aluminum Value

ENGINEER'S FIELD REPORT

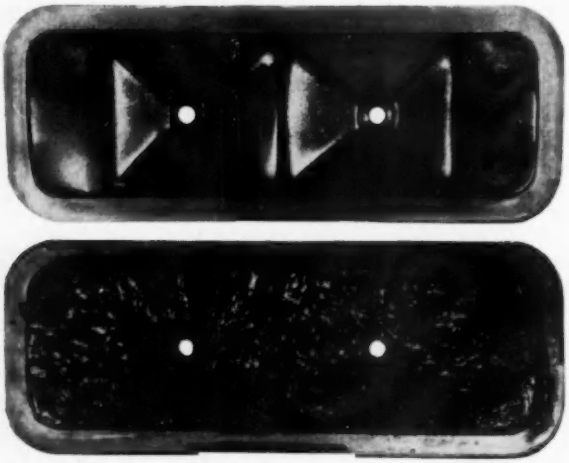
PRODUCT RPM SUPREME MOTOR OIL

FIRM VETERANS TAXICAB CO. San Francisco, California

Fleet cylinder wear only .0002″ per 10,000 miles using new RPM SUPREME Motor Oil

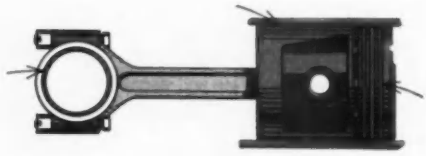


Using RPM SUPREME Motor Oil for 33,000 stop-start miles of low-temperature driving, engines of Veterans taxicabs showed average cylinder wear rate of only .0002" per 10,000 miles! Note excellent condition of piston A from typical engine using RPM SUPREME—all rings free, no clogging of oil ring vents. Piston B, from engine using conventional multi-grade oil, collected heavy deposits on rings and skirt. Oil ring vents are 40% clogged. Compare cleanliness of oil screens from these engines: with RPM SUPREME screen C remained clean, with no clogging of mesh. Screen D from other engine is 85% clogged.



Outstanding Detergent-Action advantages of new RPM SUPREME Motor Oil is proved by side cover deposit comparison. Cover at top shows virtually no deposits in 33,000 miles using new RPM SUPREME. At same mileage, heavy sludge coats cover of engine using conventional multi-grade oil.

New RPM SUPREME Motor Oil halts engine wear



- Exclusive Non-Metallic Polymeric Detergent-Action Compound keeps engines so clean, guards them so well, they last years longer.
- Anti-oxidant resists deterioration of oil and formation of lacquer.
- Engines get SUPREME protection in all seasons, climates, conditions.

For More Information about this or other petroleum products, or the name of your nearest distributor, write or call any of the companies listed below.

SUPREME RPM MOTOR OIL

TRADEMARK "RPM" AND "CHEVRON" DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado

Choose Electrical Equipment that Lasts

Continued from Page 75

situation, we have taken another look at how much we can improve the performance of the 12-volt motor. The results are excellent and it surely looks as if we can do away with the 12-24-volt system in the near future.

This improved performance of the 12-24-volt system has been obtained by using the same two batteries of the 24-volt system except that they are connected in parallel instead of in series, by using much lower cable connecting resistance than is normally used with the 12-volt motor (the total copper weight in the cables is still less than that used for the 12-24-volt system), and by reconnecting the motor so that it can handle the higher currents required for the better performance. With this system the two parallel batteries are more likely to maintain an equal charge than has been the case when using the 12-24-volt system, since both batteries are connected to the charging circuit in the same manner. As you know, with the 12-24-volt circuit the battery that is charged through the two series contacts of the series parallel switch usually has the tendency to be undercharged.

On diesel engine installations it usually seems that the starting motor is always mounted where the fuel oil will dribble on it. Unless extreme care is used in making a tight motor this oil will eventually soak the inside of the motor with the result that the commutator end brushes become oil-soaked and as a result the violent arcing will occur which greatly shortens brush life. Tight cover bands are especially important on diesel engines and a new gasket should be used each time the cover band is replaced.

Starter Drives

We are supplying at least twenty different starting motor drives. They were developed with different design approaches and to accommodate various load ratings. Each one of these designs is supplied with two to seven different pinion designs. This situation is the result of introducing new drives through the years without discontinuing enough of the older ones. We now have four drives with two different pinions each, which have the capacity to handle all truck applications.

The overrunning clutch type drive, properly applied, will assure faster cold weather starting and longer ring gear life. Considerable progress has been made during the last few years in improving the engagement and durability of the overrunning clutch drives.

Clutch type motors are shorter

(TURN TO PAGE 156, PLEASE)

3 of the REASONS for Equipping YOUR Truck with MECHANICS *Roller Bearing* UNIVERSAL JOINTS

Use 8 Less Bolts for Assembly

this will save you approximately 12 minutes of assembly time for installing the propeller shaft in your truck.

12 minutes at $1.60 per hour = ... $.32

Are 34% Lighter in Weight

on a transport type truck this amounts to 28 pounds. This adds up to 11,200,000 pounds of extra PAYLOAD your truck can carry during its life of 400,000 miles.

5,600 ton miles at $.05 per ton mile = $280.00

Need 80% Less Down-Time for Servicing

The average truck requires 4 trips to the shop for universal joint replacement parts during its life. Each trip ties up the truck 1-1/5 hours on the average.

80% of 5 hours down-time at $3.00 = $12.00
80% of 5 hours mechanic's time at $2.00 = $8.00

Total Dollar Value of Equipping Your Truck with Mechanics Universal Joints $300.32

These 3 Dollar Value reasons for equipping YOUR trucks with Mechanic's Universal Joints are but a few of the many competitive advantages our engineers will gladly detail for you.

MECHANICS UNIVERSAL JOINT DIVISION

Borg-Warner • 2034 Harrison Ave., Rockford, Ill.

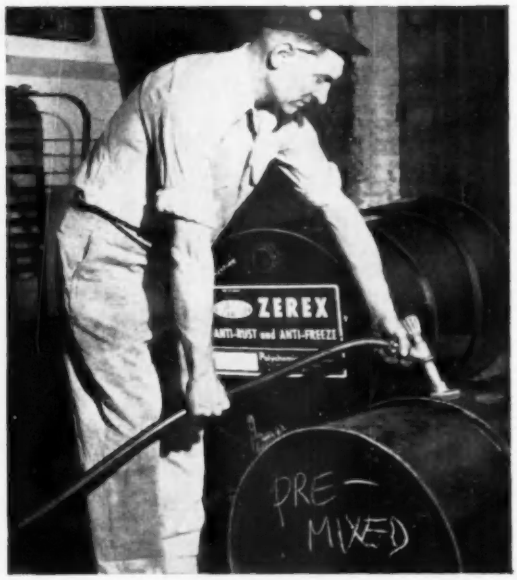
How the Du Pont Anti-
save you work,

1. Pick the best!

Photograph above shows why your costly equipment is safest when you winterize with Du Pont Zerone® or Zerex® anti-freeze.

Flask "A" contains a solution of ordinary anti-freeze with an oil inhibitor. Flask "B" contains a solution of "Zerex" with Du Pont's exclusive chemical inhibitor. To each was added the same amount of ground rust. Flasks were shaken and contents poured. Notice how film of rust clings to the inside of Flask "A" just as it would to cooling system. But Flask "B" with "Zerex" is clean—rust particles stayed in suspension—drained out with the solution. Du Pont's chemical inhibitor will never form an oily film of rusty sludge that could clog radiators, causing overheating and serious engine damage.

This is just one of the many advantages you get when you protect your equipment from freeze-ups, rust and corrosion with either "Zerone" or "Zerex" anti-freeze. Pick the Du Pont anti-freeze best suited to your needs and you have taken the first step in the anti-freeze preventive maintenance plan—that will save you work, time and money.



2. Pre-mix your anti-freeze

Both "Zerone" and "Zerex" will mix completely in water, and the rust inhibitor will not separate from the solution while standing. This permits you to pre-mix your anti-freeze solution to any degree of protection desired for use when and where you need it.

Stock your pre-mixed anti-freeze in any convenient place. It will keep indefinitely — always ready to use.

When anti-freeze is pre-mixed, installations can be made rapidly by unskilled help and without the need for individual time-consuming hydrometer checks. What's more, guesswork and the chance of costly overprotection are avoided and pilferage problems are discouraged.

Take advantage of the total savings possible when you pre-mix with Du Pont "Zerone" or "Zerex" — the quality anti-freezes that can be pre-mixed with water to stay!

Freeze PM Plan can time and money!

PREVENTIVE MAINTENANCE

3. Use the "Zerex" Test Kit

Thousands of dollars' worth of equipment is ruined each year because winter-worn anti-freeze is left in the cooling system to turn acid and cause rust and corrosion.

Now for the first time Du Pont makes it possible for you to tell – right on the job – which "Zerex" anti-freeze solutions are safe to re-use and which are worn out and should be replaced with a fresh "Zerex" solution. In this way, you can reduce cooling system maintenance expense and cut your "Zerex" anti-freeze costs in half!

And remember, *only* "Zerex" anti-freeze can be safely analyzed – on the job – with the exclusive "Zerex" Anti-Freeze Test Kit. This new method for testing reserve alkalinity in "Zerex" anti-freeze is a development of Du Pont research. It helps make possible an anti-freeze preventive maintenance plan that will save you anti-freeze and cut your operating costs.

Your best anti-freeze buy!

Note to maintenance supervisors and anti-freeze buyers: When you consider the value of the equipment you use, the investment your anti-freeze must protect and the expense of needless downtime, an efficient anti-freeze preventive maintenance plan makes good business sense.

The continuing savings made possible with "Zerone" and "Zerex" and an Anti-Freeze PM Plan far outweigh any momentary saving you might gain by using anti-freeze products of questionable performance and low initial cost.

Contact your Du Pont anti-freeze supplier or mail the coupon today – start saving now with the Du Pont Anti-Freeze PM Plan.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.) CCJ-7
"Zerone"-"Zerex" Section, Nemours 2420
Wilmington, Delaware

Please send me more information about the Anti-Freeze PM Plan.

*Name*_____

*Address*_____

*City*_____ *State*_____

*Company name*_____ *Title*_____

Electrical Equipment

Continued from Page 152

and have stiffer shafts than can be used with inertia type drive. The stiffer shaft helps prevent pole rub and where a center bearing is used the stiffer shaft lightens the load on that bearing.

Regulators Must Work

The regulator has a complicated job to do. The quality of its performance affects the life and performance of lights, battery and generator. In order to treat the battery properly the regulator should hold the voltage within ±0.2 volt for a given temperature and operating condition and should vary the voltage with respect to the temperature at a rate of .015 volt per degree, decreasing the voltage with increase in temperature.

The best setting is the one that keeps the batteries charged with the minimum use of water. In addition, the regulator has the job of getting high output when the generator is cold and a much lower output when the generator is hot.

The regulating job on the truck is more exacting than on the passenger car. Trucks use lights more; consequently, the lamp replacement costs can upshift if the voltage is high. Truck batteries, especially those used with diesel trucks, have a higher replacement cost; therefore, the wrong voltage, either high or low, should be avoided as it greatly shortens battery life.

Contact deterioration is the main cause of failure. The contact points are sensitive to high humidity and oil vapors. For this reason I stress the importance of a tightly sealed container. Proper cleaning procedures can also extend their life.

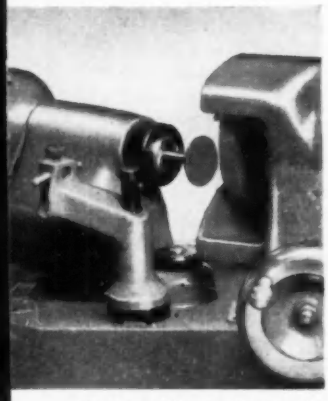
The contacts are also overworked by vibrations transmitted to them by the vehicle. It is not unusual to find that the contacts are operating five times as often due to vibrations as is necessary to regulate the voltage. So the mounting position and the quality

(TURN TO PAGE 160, PLEASE)

WINNING MECHANIC George Salih and driver Sam Hanks admire B & D Valve Shop.

RAY NICKELS, QUALIFYING WINNER with B&D's E. J. Bernau and Jay Redmon.

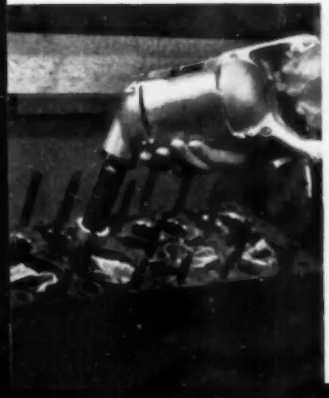
"500" winning, qualifying mechanics awarded Black & Decker Valve Shops!



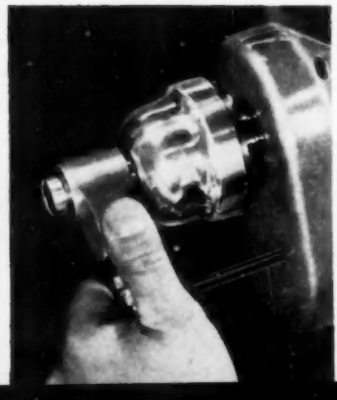
TRAVERSE GRIND at any angle. 0° to 90° valve angle adjustments.

COMPLETE VALVE SHOP ON WHEELS INCLUDES: adjustable lamp — wet grinding valve refacer — stone dressing stand — full assortment of Vibro-Centric Stones, stone sleeves, pilots in large fitted drawer — plenty of storage space.

GRIND SEATS to mirror finish without complicated adjustments.



SENSITIVE MICROMETER FEED for valve stem, rocker arm grinding.



Praise precision features of B&D POWER-BUILT equipment

Readying "500 milers" for that gruelling grind requires the best engine maintenance equipment! That's why George Salih and Ray Nickels go for their new Black & Decker complete valve shops, awarded them by Black & Decker. They like the way this great tool produces an absolutely smooth surface and true angle on valve faces; provides perfect accuracy and mirror finish to all types of valve seats, hard or soft. And, it turns out perfectly matched, gas-tight valve jobs quickly—an important factor to these men!

See for yourself how this complete Valve Shop can increase *your* profits. Call your Black & Decker distributor for a free demonstration. Or write: THE BLACK & DECKER MFG. CO., Dept. 5407, Towson 4, Md. (In Canada: P.O. Box 278, Brockville, Ont.)

Look Under "TOOLS-ELECTRIC" in Yellow Pages

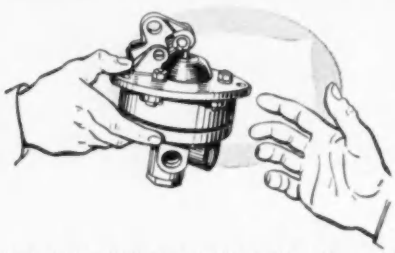
Leading Distributors Everywhere Sell

B&D Black & Decker®

Quality Electric Tools—Power-built to set the pace!

if costs have you perplexed...

HERE'S NEWS ABOUT WAGNER AIR BRAKES THAT CAN SAVE YOU MORE MONEY AND TIME!



WAGNER'S UNIT EXCHANGE PROGRAM establishes exact replacement costs *before* exchanges are made.

WAGNER UNIT REPAIR KITS provide all replacement parts commonly needed . . . eliminate need for extensive inventory.

Wagner's *Unit Exchange Program* and *Repair Kits* are both offered to help you lower your overhead and reduce repair and maintenance time.

Wagner Air Brake *Exchange Units* carry the same guarantee as new Wagner Air Brake Equipment, but cost much less. Low flat rates have been established for exchange units which are to replace units needing major overhaul and for those requiring minor overhaul. With these two flat rates, you know the exact cost of replacement *before* an exchange is made. Included in this *complete* Exchange Program are compressors, application and actuation valves, and other units from Wagner's extensive line of air brake components.

Routine air brake system repairs are easily handled in your own shop with Wagner Air Brake *Repair Kits*. These kits contain all the parts commonly needed to keep equipment in "like new" operating condition. Because no oversize or undersize parts are needed, the Repair Kit Parts have wide interchangeability. This cuts your investment in inventory and reduces shelf space requirements.

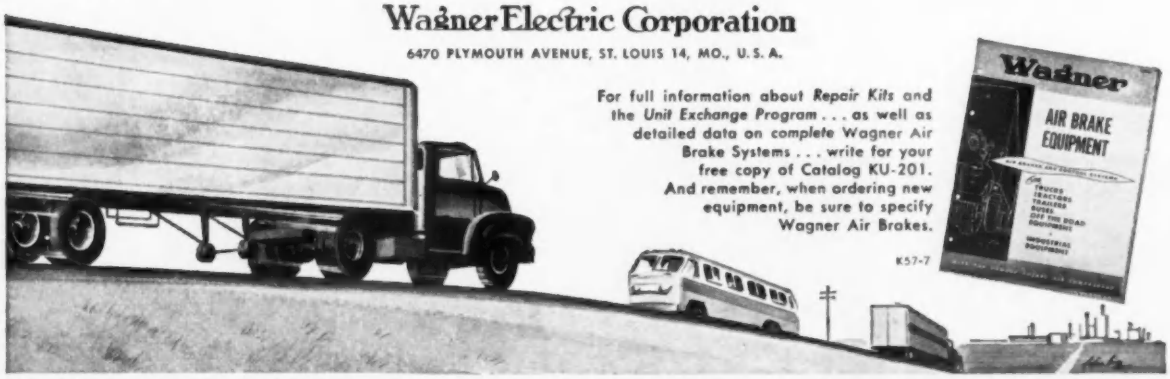
Wagner serves your every air brake need through a vast network of qualified Wagner Air Brake Distributors supplied by 24 Wagner Branch Offices located in principal cities in the United States and Canada.

Wagner Electric Corporation

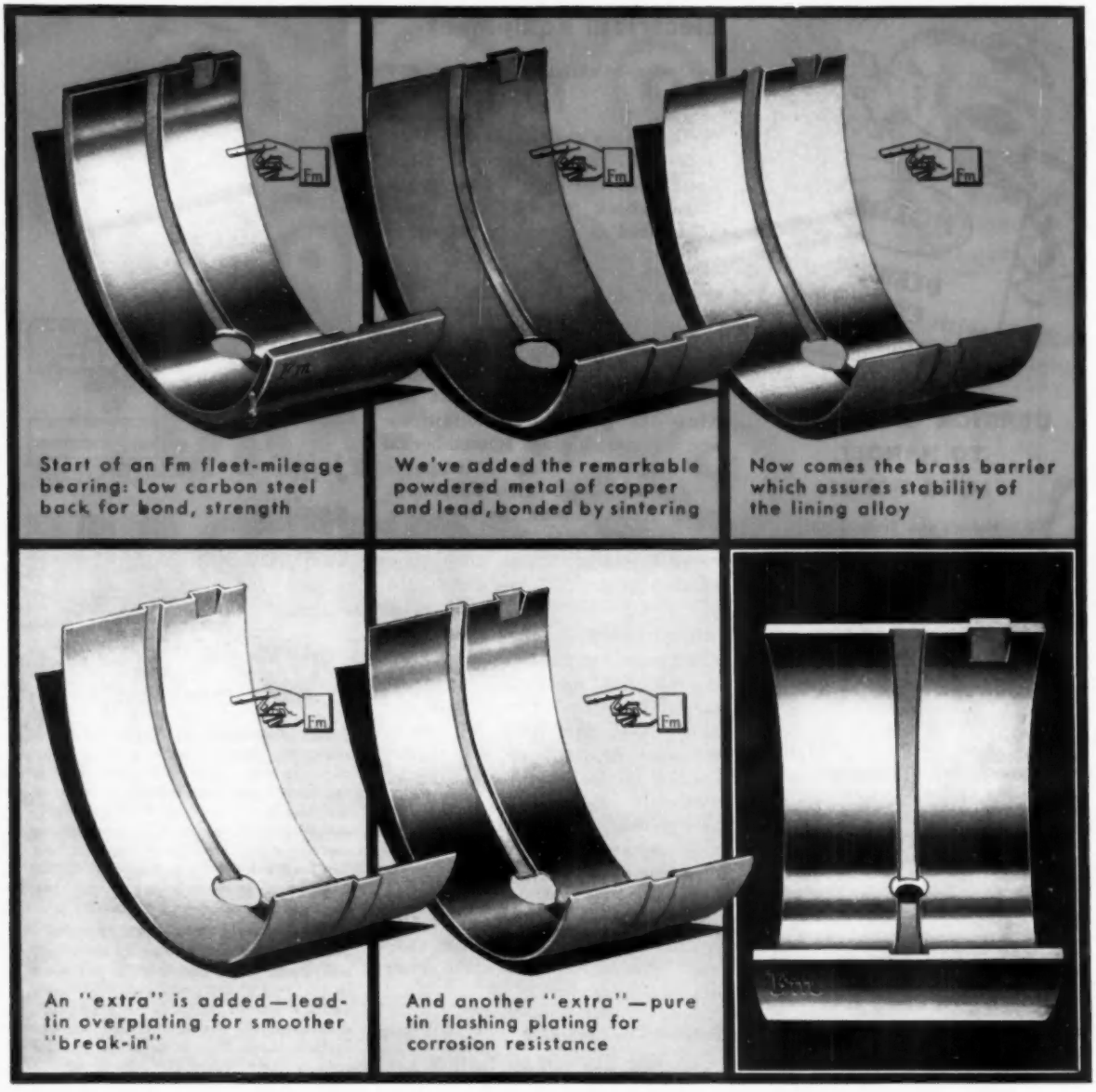
6470 PLYMOUTH AVENUE, ST. LOUIS 14, MO., U. S. A.

For full information about *Repair Kits* and the *Unit Exchange Program* . . . as well as detailed data on *complete* Wagner Air Brake Systems . . . write for your free copy of Catalog KU-201. And remember, when ordering new equipment, be sure to specify Wagner Air Brakes.

K57-7



LOCKHEED HYDRAULIC BRAKE PARTS and FLUID • NoRoL • CoMaX BRAKE LINING • AIR BRAKES • AIR HORNS • TACHOGRAPHS • ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES



Each step means you get more MILEAGE in Fm sintered bearings!

The patented, pure copper alloy metal powder is the heart of Fm sintered bearings. Each tiny, dust-like particle is a perfectly balanced alloy of copper (for strength) and lead (for softness). The result is a bearing "tailor made" to meet modern engine and operating conditions, to give you top performance, maximum mileage. Today it is preferred by fleets . . . two to one! Ask your Federal-Mogul jobber about Fm sintered bearings. He has a complete stock, gives fast service.

FEDERAL-MOGUL SERVICE

Division of Federal-Mogul-Bower Bearings, Inc.

Fleet BEARING FEDERAL Mogul SERVICE Mileage

GET IT FROM YOUR JOBBER

Electrical Equipment

Continued from Page 156

of the shock mountings are very important. Regulators for high duty truck use should have much better shock mounts than those being used on passenger car applications.

Watch Temperature

Since the regulators are temperature sensitive, they are difficult to check and adjust. No doubt many adjustments are made because the temperature conditions are not considered. Remember a difference of 20 deg in temperature is a 0.3 volt shift. Thermometers that clamp on the regulator are available for indicating the correct setting. These should be used. Also, accurate meters should always be used.

The passenger car regulator is not truly applicable to those trucks that have the batteries mounted on the frame. It is obvious that the regulator when mounted adjacent to the engine cannot control the voltage correctly for batteries mounted on the frame. If the regulator is mounted adjacent to the batteries it cannot correctly protect the generator. To do an adequate job the voltage unit must sense the battery temperature and the current unit should sense the generator temperature.

Extend Contact Life

Contact life can be further extended by using the double circuit regulator. Here the job is divided between two sets of contacts. In addition, with this design, the resistors that are connected across the contacts can be selected to give the contacts more protection.

Recent developments in the semiconductor field will enable very stable regulators to be made. These regulators do not depend upon vibrating contacts, nor upon the balance of magnetic pull against spring pull. These regulators will have a much higher first cost than the vibrating type, but this higher cost can be justified by the savings made on the

(TURN TO PAGE 162, PLEASE)

here's why...

CP TORK-MASTER*

is your best buy!

Mechanics equipped with CP Tork-Master Air-Wrenches are cutting nut turning time by 75% . . . and the time saved means extra earnings! The exclusive built-in Vari-Tork Impact Clutch with its *Controllable Power* feature requires no unwieldy or complicated torque control gadgets. You can run nuts to exact torques . . . yet have plenty of power in reserve to break frozen nuts free. *Attachable Angle Head* gets into tight spots, permits one-hand operation. And CP Tork-Masters actually cost 20% less than controllable electrics of comparable power.

* COSTS ONLY $2.50 A WEEK THROUGH JOBBERS PARTICIPATING IN CP DEFERRED PAYMENT PLAN

Chicago Pneumatic

AIR AND ELECTRIC IMPACT WRENCHES • BEAD BREAKERS
PNEU-DRAULIC TRUCK JACKS AND PUMPS • ZIP-GUNS

CALL YOUR JOBBER OR MAIL THIS COUPON TODAY!
Chicago Pneumatic Tool Company, Dept. A-48
8 East 44th Street, New York 17, N. Y.

☐ Please arrange demonstration. No obligation of course!
☐ Please send me FREE Tork-Master literature.

Name_____
Company_____
Address_____
City_____ Zone_____ State_____

Electrical Equipment

Continued from Page 160

lights and oon the batteries. This new regulator will be especially valuable where the large batteries are used on diesel installations.

Ignition Equipment

I have indicated that we know how to build generators, regulators, batteries and starting motors that will operate without need for replacement or repair until the first major engine overhaul. We do not know how to design ignition equipment with that kind of durability. Breaker points, spark plugs and waterproofing boots are worked so hard that, to date, we have not found materials which will withstand that much service.

Standard breaker points will operate 15,000 to 25,000 miles, heavy-duty points will operate 30,000 to 40,000 miles. If it is necessary to change points more frequently, then there is some condition that needs correction. Rapid wear of the rubbing block, another item contributing to short service, can be retarded by using cam lubricators.

The other distributor components such as bearings, gear, timing controls, caps, rotors and condensers can be made to operate without replacement until the first engine overhaul. When a circuit breaker cam is operated without adequate lubrication, the rubbing block is very likely to scratch the cam surface. When this has happened, this rough surface will cause rapid rubbing block wear even though adequate lubrication is thereafter maintained. I strongly recommend that all scored cams be replaced.

It's Your Move

Electrical equipment manufacturers can now supply most components that have the durability to operate to the first engine overhaul without need for removal or replacement of parts. Except for hard-worked ignition breaker contacts, spark plugs and waterproofing boots, better durability can be provided when the demand develops.

A good knowledge of electrical equipment maintenance costs should readily enable the fleet operator to determine how much premium he can pay for better durability. According to the costs we have seen, he can well afford the extra first cost of heavy-duty equipment.

Effective progress can be made if you will develop durability and performance specifications for the various classes of service based on your recommendation of maintenance cost. With this information, your purchasing agents have facts to guide them in the selection of electrical units and will be in better shape to convince management that the extra cost of the better equipment is justified.

END

Please Resume Reading Page 76

There's a wide selection of '57 Ford models available for fleet use—a model to suit every need

Have you sampled these savings in FORD fleet cars?

Sure, a fleet of '57 Fords gives you prestige and style and comfort! But there's another vital consideration—economy. Just see how Ford stacks up on that score:

You save on initial cost. Model for model, right across the board, Ford is *lowest* priced of the low-price three.* Your savings *start* with your initial purchase.

You save on operation. Ford engines are real gas-stretchers . . . with Six *or* V-8 you get extra economy on the road. You'll have further savings, too, with Ford's simplified, low-cost maintenance. And the '57 Ford is built husky and solid to *stay* out on the job—to stand up under the toughest fleet service. Your savings *continue* month after month.

You save at trade-in time. Finally, you'll discover that Ford's traditionally high trade-in value will prove still *another* saving.

See your Ford Dealer and sample Ford's savings for *your* fleet—*today.*

**Based on manufacturers' suggested retail delivered prices*

FORD FLEETS ARE LOW-COST FLEETS!

Kem Transport Enamels hold that new look for that long haul...

To Consolidated Freightways, a major highway motor carrier, keeping trailers, tank trucks, moving trucks and flat bed equipment sparkling new in appearance is all-important. But this is only one of the reasons they are large users of Kem Transport Enamels . . . long wear for more miles of heavy service keeps maintenance costs to a minimum. Kem Transport Enamels deliver these advantages and offer additional benefits when repainting time comes along.

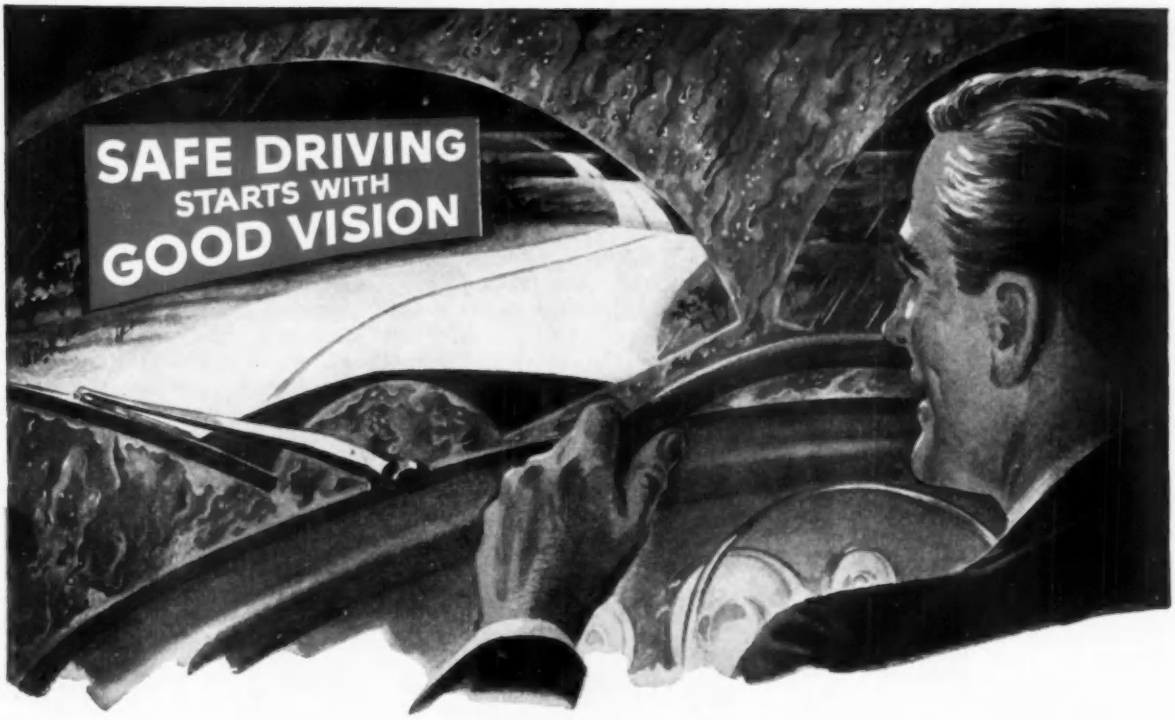
Kem Transport Enamels dry fast to cut repainting time and get equipment back on the road . . . can be applied under abnormal conditions of temperature and humidity, without fear of loss in quality. Every batch of Kem Transport Enamels is triple checked.

Find out for yourself. Call your nearest Sherwin-Williams "OK" Automotive Jobber for the facts you need to keep your equipment looking new for the long haul! Or write The Sherwin-Williams Co., Automotive Division, Cleveland 1, Ohio or Montreal, Canada.

APPROVED FOR LEADING NATIONAL FLEETS

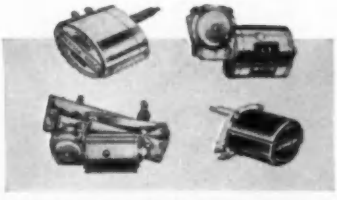
Sherwin-Williams Kem Transport Enamels are approved and recommended finishes for the equipment of many leading national fleet operators such as National Trailways Bus System, The Coca-Cola Company, Allied Van Lines, City Products Company, Dad's Root Beer, Gray Sightseeing Tours and many others.

SHERWIN-WILLIAMS
AUTOMOTIVE FINISHES



Get the Safety of—

AMERICAN BOSCH
Constant ELECTRIC *Action*
WINDSHIELD WIPERS



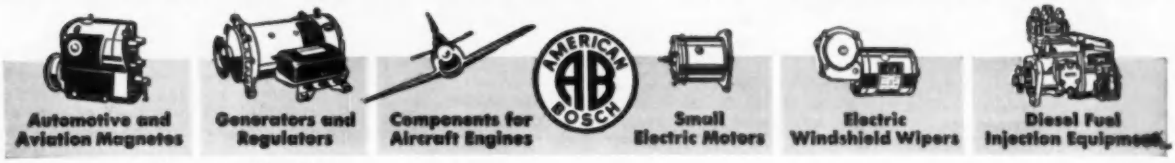
DUAL AND SINGLE TYPES FOR AUTOMOTIVE AND MARINE APPLICATIONS FOR 6-12-24 VOLT SYSTEMS

Your drivers travel more accident-free miles, even in the toughest weather, when they have constantly clear vision with American Bosch *Electric* Windshield Wipers. Regardless of speed or load, on upgrades and during acceleration, American Bosch *Constant Electric Action* is steady and dependable. Independent of engine vacuum, it eliminates stuttering, stalling blades — helps keep your drivers out of trouble on the road.

American Bosch *Electric* Wipers are in wide use as original equipment, in both Dual and Single types . . . dependable Windshield Wipers with the heavy duty construction that guarantees years of trouble-free service on every vehicle in your fleet.

Give your drivers a good start toward safe driving and protect your equipment and operating schedules — specify American Bosch Electric Windshield Wipers. American Bosch, Springfield 7, Mass. A Division of American Bosch Arma Corporation.

AMERICAN BOSCH



Select-O-Matic Transmission

Continued from Page 100

Consider next the design of the hydraulic clutch. It is of single-plate construction, using a 9-in. plate faced on both sides with a sintered metallic lining. The backing plate is made unusually thick to handle the extremely heavy loading. Clutch application is effected by movement of the hydraulic piston—pressure being supplied by a large, variable displacement pump.

The force applied by the piston is transferred to a system of force levers. These are thick, heat-treated steel plates so designed as to produce a mechanical advantage of 4 to 1. Thus the hydraulic pressure is multiplied four times in its effect upon the pressure plate.

This clutch is rated about 1000-lb ft torque capacity, maximum. Because of its enormous torque capacity the same clutch is interchangeable on all engines. Moreover, since the clutch is used in conjunction with the constantly-operating torque converter, and since this reduces to a minimum the shock loading in the system, Harvester believes that given reasonable care the clutch will last indefinitely without requiring maintenance and without refacing of the clutch plate.

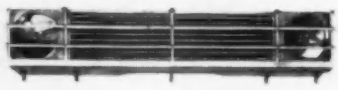
It may be noted too that the clutch is of wet type since a certain amount of fluid envelops the clutch plate. However, this is simply a wetting effect with a consequent low film drag, thus reducing friction and heat as well as shifting effect to the minimum.

The exterior view of a typical Select-O-Matic drive shows the torque converter at left, next is the clutch assembly, and at right, the synchromesh transmission. In the center are two elements of the heat exchanger for cooling the hydraulic fluid. This view does not show the side-mounted solenoid valve which is actuated from the gear shift lever.

END

Please Resume Reading Page 102

Perimeter Cold Air Flow



A new blower design for continuous truck refrigeration consists of two fans canted to provide air circulation along the truck's outside walls. According to Tranter Mfg., Inc., Lansing, Mich., this blower design eliminates undesirable recirculation of warmer air and the "blasting out" of cold air when the rear doors are opened.

ECO Tireflators

save tires, time, money

Accurate tire pressure makes tires last longer and cuts fleet operating costs. ECO Tireflators inflate to the precise pressure you select *automatically*. They save labor costs too. There is no "inflate and check" and no time lost hunting for misplaced gauges because no gauges are needed.

Wall or post and remote control models for ceiling installation let you put ECO Tireflators wherever they will be most convenient.

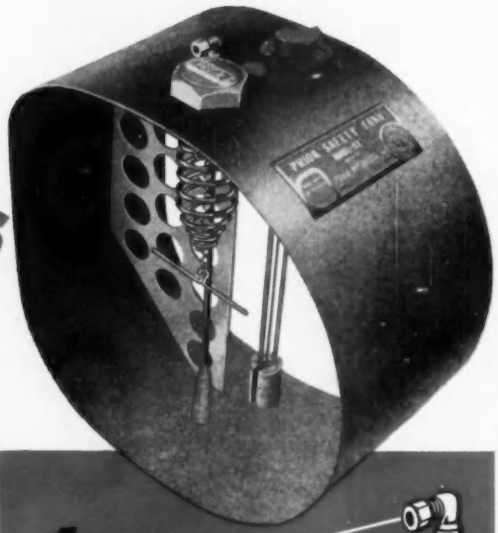
ECO Islanders® supply both automatic tire inflation and water from one unit.

Precision built to provide long life, maximum accuracy and low maintenance cost.

JOHN WOOD COMPANY
Bennett Pump Division • Muskegon, Michigan
IN CANADA: JOHN WOOD COMPANY LIMITED
Toronto • Montreal • Winnipeg • Vancouver

WHERE IT COUNTS

Prior SAFETY TANKS



A cut-away view of a Prior Safety Tank illustrates the detailed precision with which Prior Tanks are engineered and manufactured . . . inside and out . . . where it counts as well as where it shows.

Continually leading the field in safety firsts has brought Prior to sales leadership in its field for Prior has pioneered many improvements and fundamental design changes now accepted and required by the industry.

Prior still maintains the most complete line of safety engineered fuel tanks, both diesel and gasoline, and offers the finest distributional facilities to sell and service their products.

Where time is such an important factor it is good to know that wherever trucks and trailers roll they are never far from a reputable distributor who stocks Prior products and parts.

PRIOR PRODUCTS, INC.

P. O. BOX 7608 • DALLAS, TEXAS

5 BIG FEATURES

- Prior removable fuel line, easily replaced from stock.

- Prior Tank Caps with ball bearing check vent.
- Safety Fuse Plug, separate from any removable part, to insure against explosion in case of fire.
- Monel Filter Tip to protect fuel line from clogging due to dirt and foreign materials.
- U.L. and I.C.C. approved.

Underwriters Laboratories, Inc.
INSPECTED
AUTOMOTIVE FUEL TANK
No. A-11498
Meets I. C. C. Requirements for Side Mounted Fuel Tanks
94 GALLON CAPACITY - 5% AIR SPACE ALLOWED

For easier truck handling and lower maintenance cost, use

Lincoln Multi-Luber*

AUTOMATIC POWER LUBRICATION

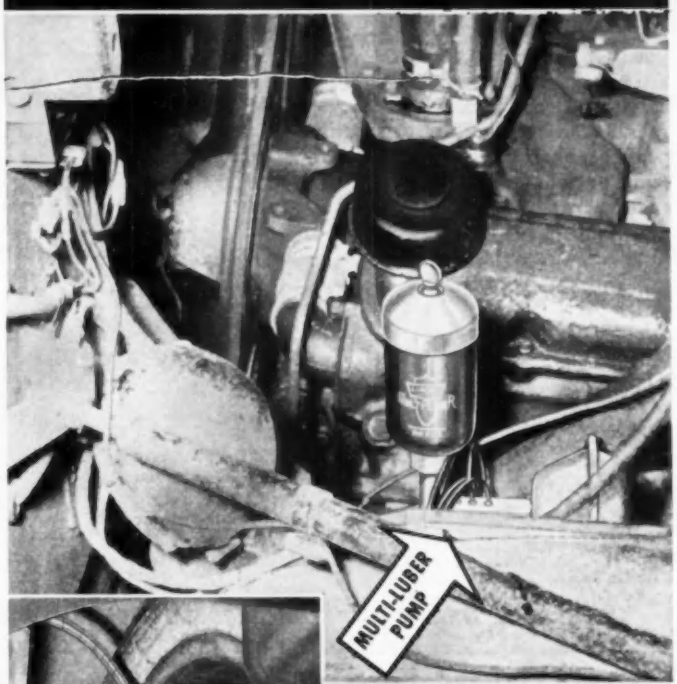
"I have had a Multi-Luber installed on our 1956 GMC Model F375 for seven months covering 16,000 miles with no trouble whatsoever with system, on any part of truck it is lubricating. It has given ease of handling in operation and has cut down mechanics time on maintenance and greasing.

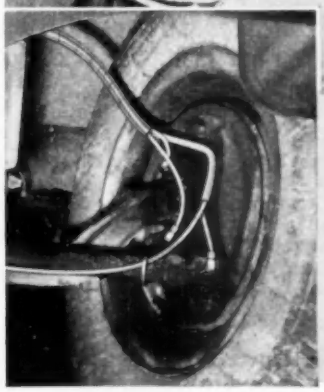
"I will be installing it on all new trucks bought in the future because it has proved its merits."

reports **GUY W. PIERCE**, *President*
Allen Express, Inc.
Boston, Massachusetts

Lubricate while you operate . . . Slash maintenance costs!

Multi-Luber automatically cycles with application of the brakes, forcing a measured quantity of refinery-pure lubricant under high pressure into every bearing. Bearing surfaces are constantly flushed, and are assured a uniform protective film of lubricant whenever motor is running. Hundreds of thousands of test miles prove Multi-Luber extends service-life of bearings and moving parts, reduces down-time and cost of replacing bearings damaged due to inadequate lubrication.





Top view shows Multi-Luber Pump on Allen Truck. Also shown is kingpin application.

For full information, write today for Bulletins 528, 533 and 534.

*Trade Name Registered

Lincoln
THE MOST TRUSTWORTHY NAME IN LUBRICATING EQUIPMENT

LINCOLN ENGINEERING COMPANY
Division of The McNeil Machine & Engineering Co.
5703 Natural Bridge Avenue • St. Louis 20, Missouri

Tru-Stop Brakes

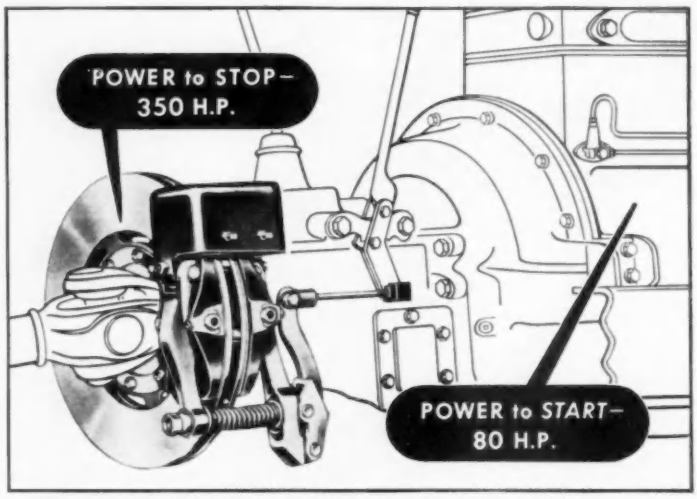
Meet Every Heavy-Duty Safety Requirement

OFFER POSITIVE PROTECTION AGAINST RUNAWAY OR PARKING ACCIDENTS—AT LOWEST COST

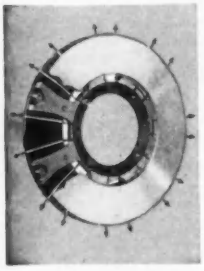
HERE IS WHY:

They have surplus power required for emergency service—no dangerous self-energizing

TRU-STOP Heavy-Duty Emergency Brakes are not only excellent parking brakes. They serve as a complete, independent and fully reliable braking system. Operating on the propeller shaft they enable the driver to continue on safely in the event of service brake failure. TRU-STOP brakes have the surplus braking capacity to be used *repeatedly* as an auxiliary to service brakes.

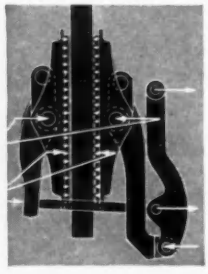


Brakes actually do more work than the engine in terms of horsepower Where it takes 80 HP to accelerate to 20 miles per hour, it takes 350 HP to make a safe stop from 20 miles per hour within required limits



Ventilated to throw off heat

Brake efficiency depends on ability to throw off intense heat —rapidly. Discs of TRU-STOP brakes are exposed to the air even during the braking operation. Ventilated design circulates air *between* the disc plates.



Give uniform brake pressure

Disc of TRU-STOP brakes is "squeezed" between the flat surface of the shoes. Effort applied to brake lever operates front and rear lever arms simultaneously. Pressure is exerted on the center of each shoe. Entire lining surface is in contact.

TRU-STOP HEAVY DUTY BRAKES OUTPERFORM AND OUTLAST DRUM-TYPE BRAKES

DON'T LET THE SURFACE AREA FOOL YOU!

Drum-type brake

43¼ square inches of lining. Lining covers 310 degrees of the drum. *BUT* only 50 degrees of the lining-covered drum is exposed to the air.

Tru-Stop brake

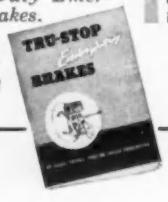
28 square inches of lining. 90 degrees of the disc under pressure. *BUT* 270 degrees of the disc is exposed to air. Directing and throwing off heat is basis of brake efficiency.

THE TEST

Drum-type Brake	vs	*Tru-Stop Brake*
After a few light and two heavy applications from 20 MPH, lining was useless for further test.		Repeatedly stopped vehicle from 50 MPH —was then used to decelerate on steep grades. No serious damage to lining.

We will be glad to answer any questions or give you more detailed information about TRU-STOP Heavy Duty Emergency Brakes. Send for

Catalog DH 33



Automotive and Aircraft Division
AMERICAN CHAIN & CABLE

601 Stephenson Building, Detroit 2
2216 S. Garfield Street, Los Angeles 22 • Bridgeport 2, Conn.

ACCO

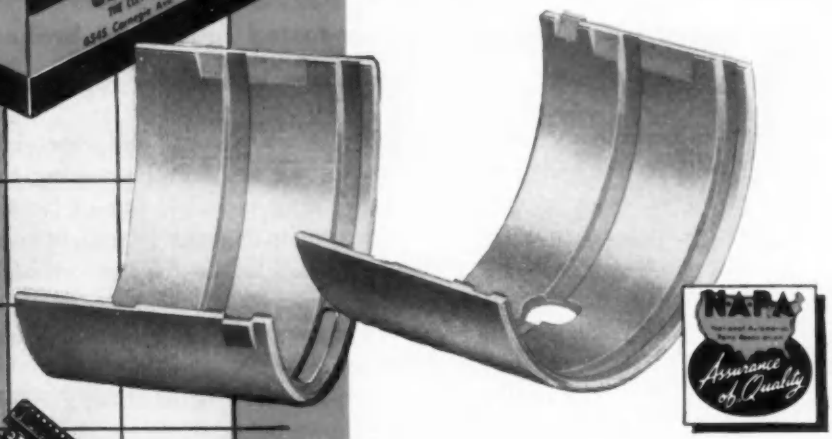
Regardless of operating conditions . . .

Here's how you profit with Clevite 77* bearings

Special high-duty design for:

. . . greatly increased mileage per bearing set
. . . improved engine performance
. . . reduced "down time"
. . . lower maintenance costs

The *complete line* of Monmouth Clevite 77 replacement engine bearings is available from your nearest N. A. P. A. jobber. Give him a call today!



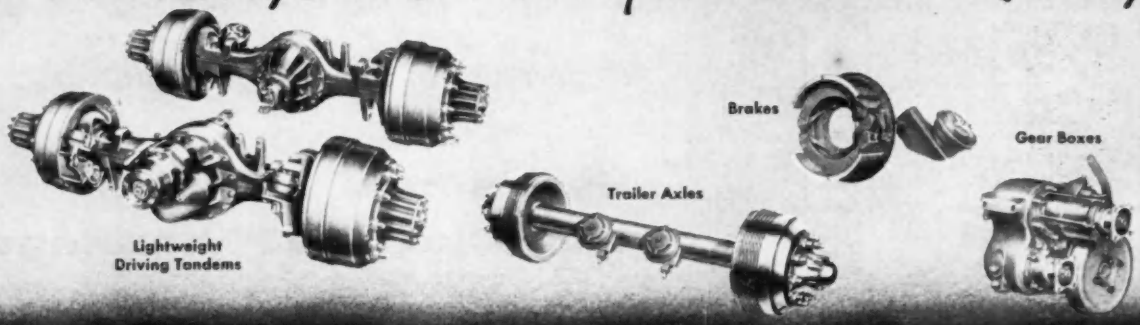
Your NAPA Jobber is a Good Man to Know!

* The words Monmouth, Clevite and Micro are registered trade marks of Clevite Corporation

Monmouth
ENGINE BEARINGS

CLEVITE SERVICE | The Cleveland Graphite Bronze Co.
Division of Clevite Corporation

For Today's Most Complete Line of Quality



SPECIFY... TIMKEN-DETROIT®

Whatever your requirements for highway or off-the-road-equipment... Timken-Detroit offers you a full line of torture-tested axles and brakes, both proven by almost 50 years of field testing and laboratory research!

Timken-Detroit manufactures today's most complete line of driving, trailer and front axles, plus brakes and gear boxes . . . with a full range of capacities in each product line.

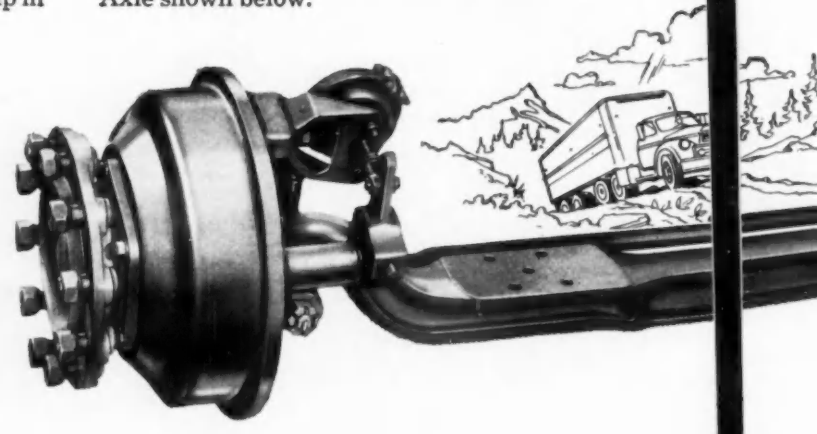
As a prime supplier to this nation's automotive industry for nearly 50 years—Timken-Detroit has learned the exacting needs of the trucking industry. The result: TDA® Axles and Brakes mean leadership in quality, service, safety and dependability.

Today we are manufacturing the industry's most complete line of front axles . . . ranging in capacity from light commercial vehicles to the heaviest off-highway applications.

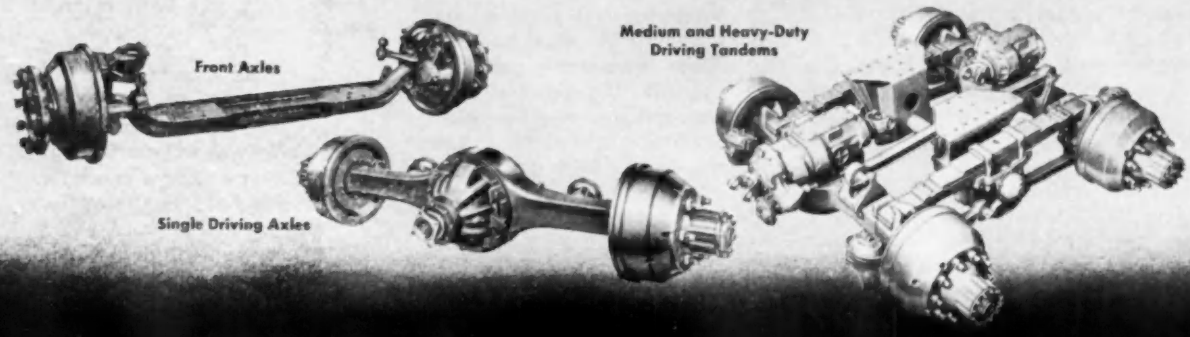
An example of the engineering features and superior quality built into every Timken-Detroit product is the F-900 Front Axle shown below.

Plants at: Detroit, Michigan • Oshkosh, Wisconsin
Utica, New York • Ashtabula, Kenton and Newark, Ohio
New Castle, Pennsylvania

TIMKEN Detroit AXLES
TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN
The Accepted TDA Standard
TRADE MARK REGISTERED



Axles and Brakes for Commercial Vehicles



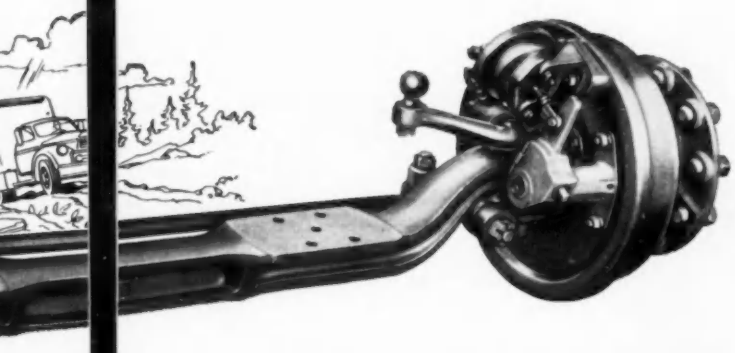
Products of

Rockwell Spring and Axle Co.

TIMKEN-DETROIT FRONT AXLES OFFER YOU GREATER STABILITY, SAFETY AND SERVICE!

You get better vehicle performance—under all conditions – with the F-900 Series Front Axles. Superior Timken-Detroit design and construction features give you front end stability – maximum strength and balance.

These improved Front Axles reduce driver fatigue . . . make steering easier . . . hold the driving path better . . . offer greater maneuverability . . . and contribute to increased vehicle life and superior performance.



Forged Axle Centers of high carbon steel are specially hardened for greater strength. The unique "Equalized-I" design between the spring pads provides uniform resistance to both horizontal and vertical forces.

Forged Knuckles of Alloy Steel are hardened for best metallurgical characteristics . . . are of improved design with large size spindles. A generous fillet where the spindle joins the knuckle body gives additional stiffness. These design features along with shot peening assure utmost strength.

Forged Steering and Tie Rod Arms are also of alloy steel and hardened. Stub arm design with carefully proportioned sections give these arms extra stamina and rigidity.

True Sphere Ball Studs in steering and tie rod arms have generous radii for maximum strength, and are induction hardened for long wear.

WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSSES AND TRAILERS

Economics and Diesel Engines

Continued from Page 80

eration and less shifting on grades, which reduces the trip time. Under some conditions, the fewer engine revolutions per mile resulting from less shifting could even give better economy (mpg).

The effect of engine power and terrain was illustrated by two vehicles having 160 hp and 175 hp and which were run over two courses representing quite different terrain. Both courses were 300 miles, but one was flat while the other was hill country. Cruise speed was limited to 50 mph with a GVW of 55,000 lb.

Over the flat country, the higher powered tractor gave 2.8, mph higher average speed at a cost of .28 mpg in fuel burned. As this was only the difference between 7½ and 8 hours, there was no commercial gain.

As demonstrated by this series of tests, the factors that affect economy (mpg) can be summarized briefly as follows:

1. "Cruise speed" is a prime factor in fuel consumption (mpg).
2. "Average speed" does not increase in proportion to "cruise speed."
3. Total "engine revolutions per mile" is a prime factor in fuel consumption (mpg). High engine speed, traffic requiring much gear shifting, and hill climbing all give high total engine revolutions per mile and low mpg.
4. At a given road speed, fuel burned increases as the engine speed and total engine revolutions per mile are increased. Fuel is wasted in pumping air. Rear axle ratio affects this somewhat, but the greatest loss comes from driving in a gear lower than required to maintain position in traffic.
5. At maximum engine speed, fuel economy (mpg) is low, regardless of road speed.
6. Best economy (mpg) is obtained at the lowest engine speed at which position in traffic can be maintained.
7. Higher engine horsepower increases performance (hill climbing ability and acceleration) and cruise speed, and decreases gear shifting and economy (mpg). Average speed may or may not be increased, depending on traffic conditions and driver schedule.
8. Under some conditions, higher horsepower may require less gear shifting and give better economy (mpg), if the total engine revolutions per mile should be reduced.
9. In the 35 to 50 mph range, each increase of one mph in cruise speed decreases economy (mpg) by roughly 1/10 mpg.

END

Please Resume Reading Page 81

"Stainless Steel trailers have licked our corrosion problem"

Mr. Ellis (standing) has a talk with his General Manager, Claude Caylor.

A case study of
Ellis Trucking Company, Indianapolis, Ind.

In 1919, Fay Ellis converted an old Cadillac into a truck and started hauling things around Indianapolis. Today, his Ellis Trucking Company owns 250 tractors and 425 trailers, and it's growing bigger all the time.

According to General Manager Claude Caylor, "We use Stainless Steel trailers because they don't rust, don't have to be painted and don't wear out like the ordinary trailer. They give much longer working life.

"We figure we save about $300 annually on each Stainless trailer. This estimate is based on the money we *don't* spend for a yearly paint job, re-lettering and removing rust spots. Also, we earn extra revenue, because these trailers spend their time *on the road* . . . not in the shop."

Recently, Ellis started buying Fruehauf's new Stainless Steel Volume Van. Here, in addition to the lower maintenance, they average increased earnings per mile of 15% to 20% because they can haul a greater volume of lightweight cargo.

When you are trying to compare the cost of Stainless Steel with other types of construction, remember this one overpowering fact: Of the thousands of Stainless Steel trailers in use, *not one has ever been known to wear out.*

Two Ellis rigs ready to roll. Both trailers are Stainless; the one at the left is new Fruehauf Volume Van.

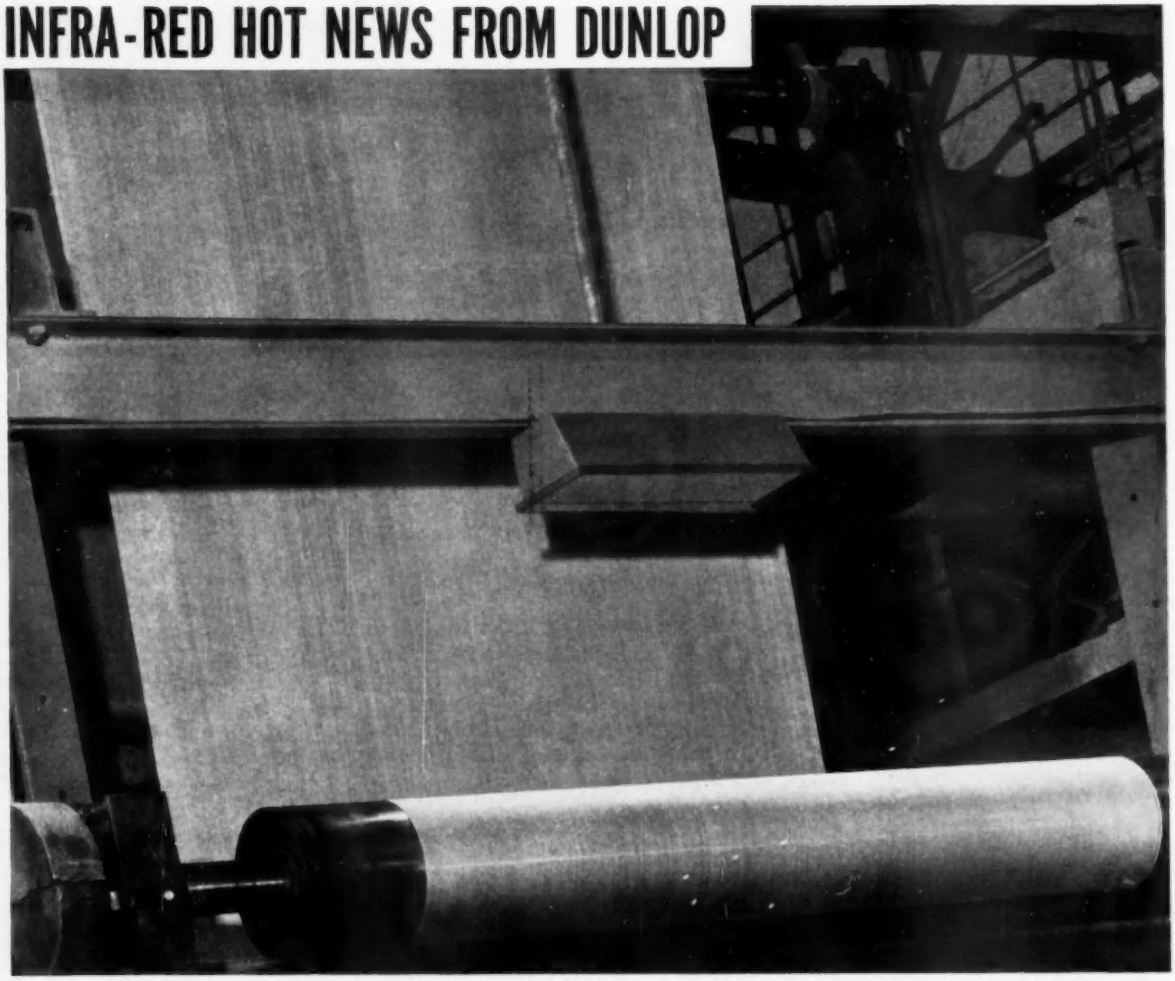
UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • NATIONAL TUBE DIVISION, PITTSBURGH • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL

INFRA-RED HOT NEWS FROM DUNLOP



DUNLOP...first with INFRA-RED for new strength in nylon tires

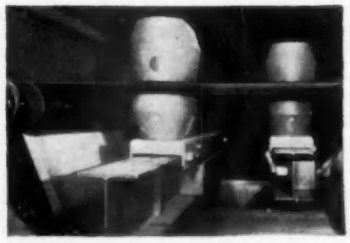
Adding to an impressive list of major tire-building advances, Dunlop is the FIRST and ONLY tire manufacturer in the industry to increase the native strength of nylon tires through Infra-Red tempering.

Now... nylon cord, stretched and heated under deeply penetrating infra-red lamps, achieves a high degree of strength and stability never approached by outmoded oven-heat processes.

Combined with Dunlop's AccuRay and other advanced quality control techniques, this unique and revolutionary process makes Dunlop nylons the STRONGEST on the road today.

Test these "new strength" nylons on YOUR equipment...watch original mileage and recap recovery go up... while costs-per-mile go down. Available in tubeless or tubed, for on or off-the-highway service.

Dunlop's AccuRay... *a new atomic process which precisely controls cord ply thickness. Only* EXACT *amounts of protective rubber are uniformly applied to Dunlop plies. As a result... Dunlop tires are stronger... SAFER... better-balanced.*



You'll go farther...safer...on tires by

DUNLOP —they're AccuRated

DUNLOP TIRE and RUBBER CORPORATION, BUFFALO 5, N. Y.

FOR TODAY'S BIGGER PAYLOADS AND HIGHER MILEAGES—

The WHITE 3000!

With mileages and payloads going up—up—up—there's greater reason than ever before to standardize on White Highway Tractors.

Whites are payload-designed to the exact operating requirements for more profitable trips . . . for your business now and for years to come!

Whites have the reserve strength and power that keep 'em rolling—1957 style! White quality has been proved in toughest service.

And White has the service facilities—available parts—coast to coast to keep down-time down.

Here are the real reasons for White dependability and earning power. Why not investigate—for your business—without delay.

THE WHITE MOTOR COMPANY
Cleveland 1, Ohio

Why Another Fleet Has Standardized on Whites

To quote Tom Black, president, Tom Black, Inc., Knoxville, Tenn. "... White Trucks have been highly satisfactory in our operations in 22 states. Our loads are very bulky, but not heavy, so the White 3000 is especially advantageous with 35 ft. drop frame trailers. Whites are more economical as to fuel and maintenance cost—we've standardized on Whites."

White
THE TRUCK THAT KNOWS YOUR BUSINESS!

For more than 55 years the greatest name in trucks

Manufacturers' Literature

(See Page 44 for Fleetman's Library)

How to cut earthmoving costs with "Lowbowl" scrapers is shown in a new booklet from Caterpillar Tractor Co. A circle around L 6 on the postcard on page 182 will bring it to you.

Identification signs of porcelain enamel for trucks and trailers are described in Ingram-Richardson Mfg. Co.'s new bulletin. Circle L 7 for your copy.

Automotive lube equipment and accessories are illustrated and described in Aro Equipment Corp.'s new 52-page catalog. You can get a free copy by circling L 8 on the postcard on page 182.

Pressure-sensitive decal signs are shown and described in a new bulletin issued by The Meyercord Co. For information on decals which are applied without moistening, circle L 9 on the postcard.

New dump bodies for contractors and municipal fleets have been developed by Daybrook Hydraulic Div., L. A. Young Spring & Wire Corp. For details, circle L 10 on the postcard on page 182.

Services and facilities available to Caterpillar equipment users are described in the company's new pamphlet. Circle L 11 to get it.

Stem guide reamers for aligning worn guide holes are described in a new catalog sheet from Albertson & Co. Circle L 12.

Metal-faced plywood panels are described in a new folder issued by United States Plywood Corp. The folder describes use of the product for truck and trailer floors and doors. You can get a free copy by circling L 13 on the postcard on page 182.

New gasket kits for winches — relating kits to winch models — are shown in a new parts list issued by Braden Winch Co. To get it, circle L 14.

Rubber truck bumpers designed for installation on the rear of any truck are described in a new catalog sheet from Bumpers, Inc. You can get it by circling L 15.

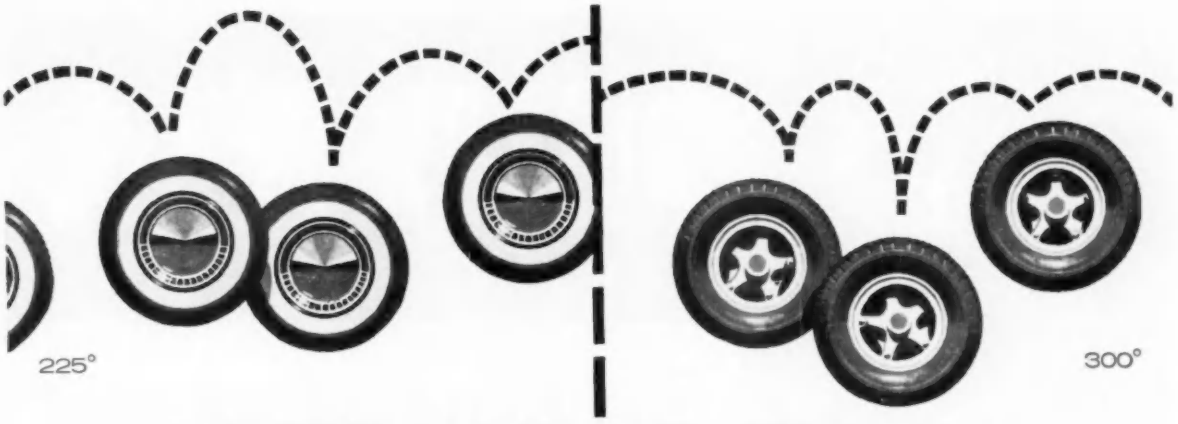
Spray booths of every type, size and application are shown in DeVilbiss Co.'s new catalog. Also included: "How to Select a Spray Booth." A copy will be sent free if you circle L 16 on the postcard on page 182.

Gasket cutter for use on asbestos, rubber, fiber or cork is described in Garlock Packing Co.'s new bulletin. You can get a copy by circling L 17.

Retracting cord reels are described and illustrated in color in a new 16-page catalog issued by Cordomatic Division, Vacuum Cleaner Corp. of America. Circle L 18.

Two-way radio interchangeability principles are explained in General Electric Co.'s bulletin ECR-458. To find out about increasing a system's flexibility through interchanging components, circle L 19 on the postcard.

Vapor lock causes and how to prevent them with a fuel pressure regulator are discussed in a new bulletin from Alondra Sales, Inc. Circle L 20 for your copy.



TIRES CAN GO CRAZY WITH THE HEAT!

and no tire cord made stands up to heat like tough new Super Rayon!

When your cars and trucks hit the road, *the heat's on!* Passenger tires average 225° running, truck tires 300°. Some new tire cords go crazy with that heat—they can swell and go soft (and then shrink and go hard), with tread cracking, "chunk outs," shorter tire life.

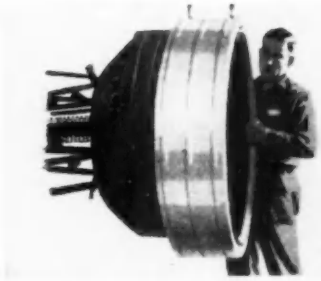
There's nothing like the new tire Rayon for sweating it out. Stable, new Super Rayon withstands heat better than any tire cord at running temperatures.

That's one advantage of Super Rayon; there are more. Here's what they mean to you as a fleet operator:

1 **Rayon costs you less.** Of course you can pay more for tires. You have plenty of chances to do that. But for new Super Rayon's premium performance, you actually pay less. So today's new Rayon, vastly improved in recent years, can play a very important part in your profit picture.

2 **Less down time.** Super Rayon's ability to stand up to heat gives you superior performance and operating efficiency. Its stability as it stays on the job keeps your tires in top shape, without cracking and "chunking" problems, keeps your fleet operating profitably.

3 **Rayon lasts you longer.** New Rayon has the strength of steel, pound for pound, and the Rayon tire cord from one tire actually has the muscle to lift a 12,000-pound truck. Extra strong and durable, Super Rayon cord gives you a tread wear bonus of 7 to 20%.



4 **It retreads better.** When you buy one tire, you're in effect getting several. Rayon's freedom from shrinking and stretching, plus the fact that it adheres better to rubber than any other tire cord fiber, makes it best for efficient, economical retreading—and retreading!

5 **No thumping and bumping.** Less driver fatigue and annoyance. Super Rayon is 100% flexible under all conditions, doesn't soften or harden with temperature changes; no overnight "flat spots" you often get with tires made of other tire cords, and driving's smoother, quieter—and thereby safer.

keep fleet profits up with *new Rayon cord tires!*

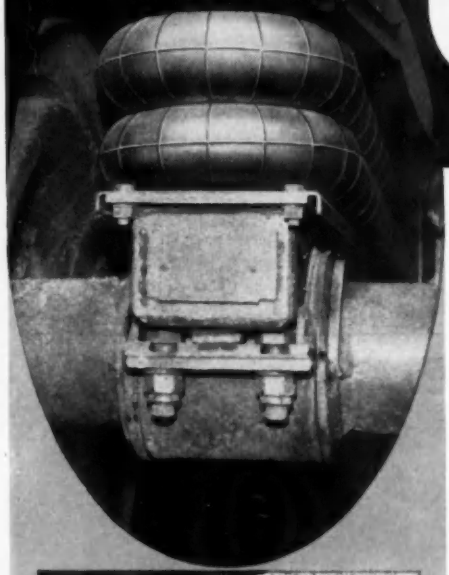
AVISCO® TIRE RAYON

9 out of 10 tires on the road are made with *Rayon cord!*

AMERICAN VISCOSE CORPORATION
350 FIFTH AVE., NEW YORK 1, N. Y.

PROVED OVER
MILLIONS OF MILES

GENERAL



. . . Rated tops by
for Cutting

Complete suspensions with

GENERAL AIR SPRINGS

are immediately available

from

- ★ Homan & Company, Incorporated, Cincinnati, Ohio
- ★ Neway Company, Muskegon, Michigan
- ★ Krause Corporation, Hutchinson, Kansas
- ★ Spencer-Safford Loadcraft, Inc., Augusta, Kansas
- ★ Trucktor Corporation, Mountainside, New Jersey
- ★ Youngstown Steel Car Co., Niles, Ohio

Pacific Intermountain Express, Oakland, Cal.

Eldon Miller, Inc., Iowa City, Ia.

A. F. Posnik, Inc., Detroit, Mich.

Roadway Express, Akron, Ohio

THE GENERAL TIRE & RUBBER COMPANY

AIR SPRINGS

Big-Fleet Operators Costs and Cargo Damage!

Before you authorize the purchase of another trailer or tanker, you owe it to your profit picture to take a close look at the new General Air Spring.

Precision engineered to cushion all-type loads and equipment against damaging road shock and vibration, General Air Springs cut maintenance and operating costs appreciably . . . reduce cargo damage to a minimum.

What's more, General Air Springs permit more payload space for bigger profits while keeping loads on an even keel and doors tightly sealed against outside elements.

Follow the lead of the fleets that have learned the cost-saving advantages of the General Air Spring. Put your new units on General Air Springs or plan to convert your present equipment.

SPECIFY GENERAL AIR SPRINGS ON YOUR NEW EQUIPMENT

Yellow Transit Freight Lines, Inc., Kansas City, Mo.

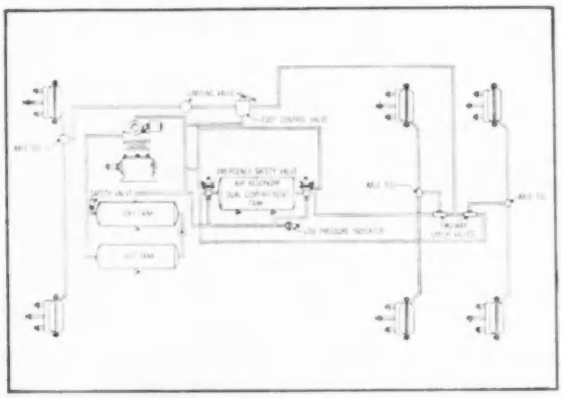
Transcon Lines, Los Angeles, Cal.

THE GENERAL AIR SPRING

Akron, Ohio • Air Spring Division • MEMBER OF T. T. M. A.

NEW PRODUCTS

THE LATEST DEVELOPMENTS IN PARTS, ACCESSORIES, TOOLS AND EQUIPMENT FOR THE FLEET FIELD, DESCRIBED IN BRIEF FOR YOUR CONVENIENCE

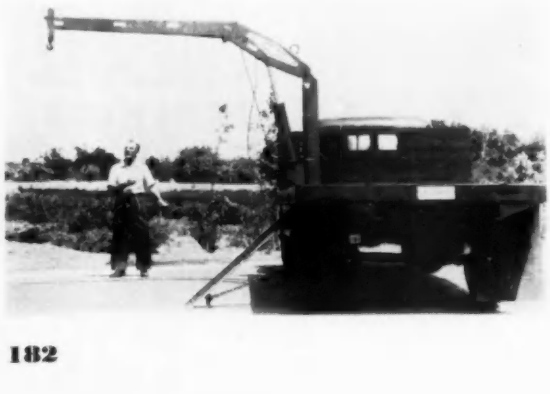


P1. Emergency Brake System

Power Brake Equipment Co., Portland, Ore., has announced an emergency air brake control system for trucks and truck-trailer combinations that features a "sealed-in" air supply entirely independent from the vehicle's main air supply. This system operates only when the main air supply is lowered to a point below safe operating pressures. When a driver attempts to start his truck under these conditions, the emergency brakes apply immediately and release only when the air pressure reaches normal operating pressure. The braking action is ratio-controlled to insure smooth braking. This system may be installed without requiring changes in the present air systems.

P2. Crankshaft Grinder

Lempco Products, Inc., Bedford, Ohio, is now manufacturing a crankshaft grinder for regrinding both large and small crankshafts. The grinder features five separate motors for power operation, with centralized control on one panel. The swing is 26 in., length capacity is 86 in., and the stroke is 10 in. The grinder is equipped with graduated throwheads with 10-in. diameter chucks, an electromagnetic crankshaft balance meter, outboard counter balancing, as well as pressurized spindle bearing lubrication and tapered bearings throughout.

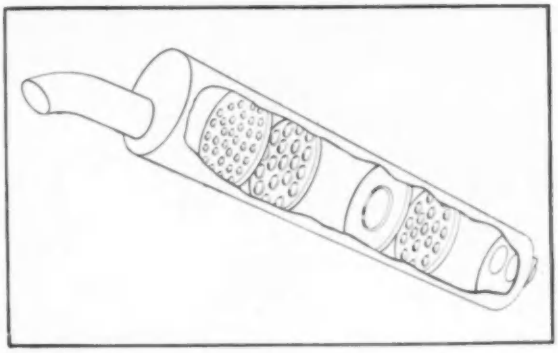


P3. Truck Hydraulic Crane

Jeffrey Crane Co., Hamilton, Ohio, announces a 2000-lb capacity hydraulic truck crane which permits loading and unloading from any point on a truck bed. The crane mounts on any truck, tractor or dock and can be locked in several positions in its 360° rotation range. Remote controls permit the operator to be as much as 20 ft away. The crane features a 9-ft boom with a rolling trolley which permits a load of 2000 lb to be rolled to any position on the truck when the boom is in a horizontal position. Hydraulic power is supplied by a choice of power take-off driver or electric pump.

P4. Muffler

Teck Industries, Columbus, Ohio, announces a heavy duty muffler which features a series of venturi-shaped baffles arranged to create "sound boxes" to maintain noise control. The size of the venturis in the baffles is synchronized to the cubic inch displacement of the engine, and the shape of the baffles is designed to direct the hot gases to the outer shell of the muffler to reduce back pressure. The orifice-shaped holes are arranged to speed gas flow through the muffler and eliminate vacuum, a cause of "burnouts."

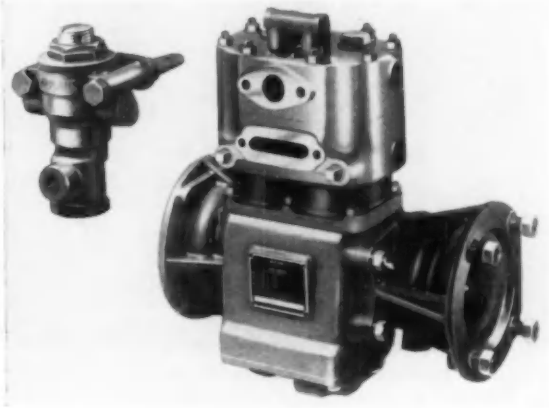


P5. Refrigeration Unit

Hunter Mfg. Co., Solon, Ohio, has introduced a heavy duty refrigeration unit especially designed for efficient maintenance of temperatures for products in the 35 to 45° range. The unit can be used in adequately insulated bodies up to 18 ft long. All components except the compressor are included in a package designed for mounting in the upper front wall of the truck body. The compressor mounts on the truck engine and is driven by a V-belt from the crankshaft. According to the manufacturer, the design allows the entire system to be charged, tested, disconnected for shipment and re-connected without gaining or losing air in the system. The unit features thermostatic switch temperature control, automatic and manual defrost control, and individual 12-volt DC fan motors which operate from the truck generator and which automatically cycle off when the evaporator and condenser fans are not needed.

P6. Truck Air Compressor

Midland Steel Products Co., Owosso, Mich., is now marketing a new air compressor for trucks equipped with Cummins engines. According to the manufacturer, the compressor requires less horse power per cubic foot of air. Another feature is that the built up time from zero to 100 psi at crankshaft speed of rpm is 15 sec with a 1080-cu in. tank.



P7. Conversion Hoist

Hercules Steel Products Co., Galion, Ohio, announces a hydraulic hoist suitable for conversion installation on ¾ and 1-ton trucks. The hoist is designed for use under 8-ft, light duty dump bodies, 10-ft platform bodies, and 6½ to 9½-ft pick-up bodies, with a CA dimension of 46 to 60 in. The design features dual ram-type 4-in. cyl placed ahead of the truck rear axle for hoisting efficiency. The hoist has an optimum capacity of 6 tons, a 45° dumping angle, and an 8 9/16-in. mounting height. Oil reservoir, manifold, remote control valve and power take-off driven pump are unit mounted on the hoist subframe. Hoist operation is completely controlled from the cab.

(TURN TO PAGE 186, PLEASE)

A section of the Eastern Express terminal in Chicago, Illinois

Eastern Express, Inc., one of the largest motor

RAYON CORD

Eastern Express, with general offices in Terre Haute, Indiana, operates mostly between industrial points in the Midwest and in the Atlantic States, New England excluded. Eastern Express trucks average over 30 million miles yearly, or the equivalent of more than three times around the world every day. By far the great majority of this mileage is covered by rugged RAYON CORD TIRES!

Eastern Express finds Rayon Cord Tires pay off in greater mileage—average original mileage is 67,000, with an average of one-and-a-half recaps per tire. But it is Rayon's *safety* that pays even greater dividends to Eastern Express. Here is proof: Eastern is the proud owner of a tire performance and safety and claim record—*the first major carrier to go over 2,000,000 miles without an accident of any kind!*

Eastern is the first major carrier operating between large industrial areas to receive a safety trophy from

One of Eastern's largest trailer trucks, and it rides on Rayon!

Eastern receives trophy for 2,086,134 accident-free miles.

carriers in the U. S. proves

TIRES PAY OFF!

National Freight Claims Council of A.T.A. Eastern has also been awarded a trophy from Transportation Underwriters for having gone 2,086,134 miles without an accident.

This impressive safety record is largely due to Rayon's dependability and Eastern's strict tire-checking program. Each tire carries a decal which establishes correct pressures and rotation dates for that particular tire.

AMERICAN RAYON INSTITUTE INC.

Records show that more truckers use RAYON CORD TIRES than any other. They can rely on Rayon because Rayon pays off!

AMERICAN RAYON INSTITUTE, INC.
350 Fifth Avenue, New York 1, N. Y.

New Product Descriptions

Continued from Page 183

P8. Five-Way Signalling Switch

When Signal-Stat Corp. introduced its new No. 900 "Sigflare" switch via our May issue (item P-6), it appears that our description was not complete. In addition to serving as a Class A-Type 1 signal operating unit, the No. 900 also serves the following functions:

1. Flashes all four signal lamps simultaneously to indicate that the vehicle is disabled.
2. Permits the two rear signal lamps to act as tail lights.
3. Permits the two rear signal lamps to act as stop lights.
4. Automatically controls the tail light when signalling turns at right.

The last three functions are accomplished through the use of double contact, double filament bulbs of the type generally similar to accepted passenger car practice.

P9. Detergent

Oakite Products, Inc., New York, has introduced a new liquid detergent designed for use in solution lifting steam guns and self-generating steam cleaning equipment. The detergent was developed to simplify the preparation of steam cleaning solutions and to reduce the clogging of coils in self-generating equipment. It will handle a variety of steam cleaning operations ranging from light to medium heavy duty, and is said to provide effective soil removal at concentrations of 1 to 2 ounces to each gallon of water. Its solutions have a pH of 12 in the operating range and are claimed to be safe when used as recommended on steel, brass, magnesium, and painted surfaces.

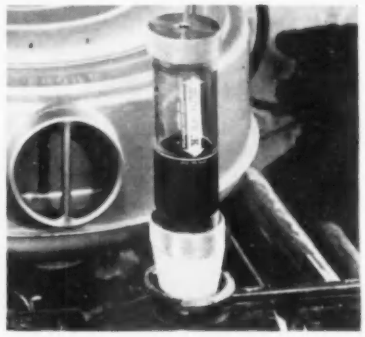
P10. Front Hoists

Gar Wood Industries, Inc., Wayne, Mich., is now marketing front mounted telescopic hoists, that feature a ball and socket mounted arrangement at the base and top of the cylinder to eliminate side load stresses. Wide brass bearings inside the cylinder provide a large bearing surface to protect the cylinder walls. Heavy brass packing nuts at top and base of each cylinder makes proper adjustment of packing easy. An automatic safety relief valve eliminates high pressure at the end of the cylinder stroke, reducing overheating, wear and leakage. A safety control valve stops further movement of the hoist at the end of the stroke to prevent overtravel damage.

P11. Circuit Tester

Ray-O-Vac Co., Madison, Wis., is now manufacturing a continuity tester flashlight. This tester is

equipped with a jack to plug the unit into the end cap of the flashlight. Both the jack and the wire leads of the tester are insulated and positive spring grip clips are used to make contact. When a continuous circuit is tested the flashlight lights; if the circuit is broken or defective the flashlight indicates this by not lighting. This tester may be used for checking wiring, controls, circuits, fuses, grounds, shorts, opens, broken wires, switches, limits, relays, burglar alarms, motors and also for checking and setting contacts.

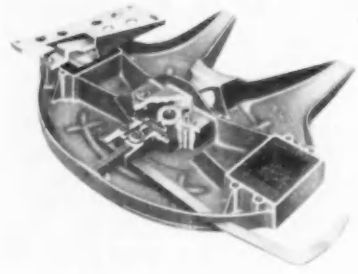


P12. Leak Tester

P & G Mfg. Co., Portland, Ore., is now marketing a tester for internal combustion engine leaks. According to the manufacturer, the tester makes it possible to determine in which cylinder or cylinders the leak is occurring. To test, the tester is placed in the radiator opening. With the engine running the combustion gases will pass into a sensitized fluid which will remain blue in color unless there is a combustion leak. In this case, the fluid will change to a light yellow. The location of the leak can then be determined by disconnecting one or two spark plugs at a time.

P13. Fifth Wheel

Dayton Steel Foundry Co., Dayton, Ohio, has announced a new fifth wheel which features precision-machined coupling jaws that provide complete 360 deg king pin locking surfaces. A spring automatically opens the jaws and holds them open until coupling takes place. Minimum king pin pressure closes the jaws by overcoming spring tensions. According to the manufacturer, the spring-opened jaws never have to be forced open, eliminating the necessity of "ramming" and protecting the fifth wheel from damage. The design also includes rubber compression bushings and shock eliminators in one unit.



(TURN TO PAGE 188, PLEASE)

Dayton Raw-Edge Cog-Belts* first choice of the *show me* guys

Fleet maintenance supervisors and their mechanics are the first ones to see when you want to know about Dayton Cog-Belts.

They've seen Dayton Raw-Edge Cog-Belts coming into the fleet as original equipment. And, they're smart enough to know that when a manufacturer specifies stronger, surer-gripping Raw-Edge Cog-Belts they'd better replace with Cog-Belts or start looking for trouble.

What's more, costs and time are important to these men. They want to reach for a belt—not wait for it. That's why they're *standardizing* on Dayton Cog-Belts. Not only are Dayton belts the best you can buy . . . but you can carry a full inventory with about 2/3 the number of belts you now have in stock.

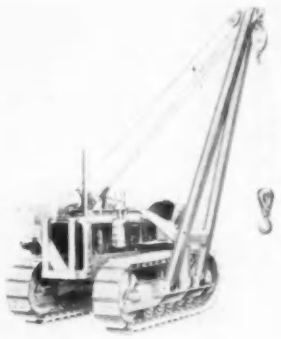
If you're interested in keeping your trucks on the road . . . keeping your repair bays open . . . keeping costs and inventory down . . . *standardize* now with Dayton Raw-Edge Cog-Belts. They last longer because they resist oil and grease, are unaffected by heat or cold and are built with synthetic fibers that—ounce for ounce—are stronger than steel.

New Products

Continued from Page 186

P14. Wrench Calibrator

Skidmore-Wilhelm Co., Cleveland, Ohio, has introduced a hydraulic torque wrench calibrator capable of testing torque wrenches to within 1 per cent of accuracy of full scale reading. To use, the operator puts his wrench in a coupling and turns it, creating a hydraulic pressure within the unit. This pressure is measured by a calibrated hydraulic gage which makes readings directly in torque. The calibrator is available in three sizes, each with an option of two torque range readings. The smallest unit weighs 7 lb, and has torque readings of 0 to 200 in.-ounces, or 0 to 200 in.-lb. The second calibrator weighs 14 lb and makes measurements in ranges from 0 to 60 ft-lb, or 0 to 150 ft-lb. The largest instrument, weighing 65 lb, measures from 0 to 600 ft-lb or 0 to 200 ft-lb.

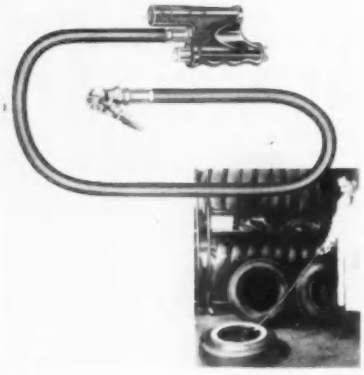


P15. Pipelayer

Midwestern Mfg. Co., Tulsa, Okla., is now marketing a hydraulic pipelayer designed for use with a caterpillar D4 tractor. The pipelayer has a lifting capacity of 17,500 lb at a four ft overhang and has a boom length of 13 ft. The pipelayer provides a tractor clearance of 13½ in. A closed hydraulic system which controls the side-boom makes possible precise positioning of heavy loads. A pipe bending attachment and an angle filler for backfilling purposes are also available.

P16. Chuck Gage

A. Schrader's Son, Brooklyn, N. Y., announces a chuck gage especially designed to comply with the mounting



recommendations for tubeless tires. A chuck clip and 3 ft of hose permit standing back as beads are seated in mounting tires. The chuck gage features a replaceable gage unit and a single push button control of inflating, gaging, and deflating. It is calibrated from 16 to 110 lb.

(TURN TO PAGE 192, PLEASE)

OVER-ALL ECONOMY. The extras offered by nylon cord tires—fewer tire repairs, fewer road delays, more retreads, lower tire inventories—mean more miles per tire dollar . . . greater over-all economy.

ROAD DELAY due to blowout of damaged sidewalls is eliminated for Golden State trucks by nylon cord tires. Nylon guards against every major cause of tire failure—flexing, moisture, heat and impact.

MORE MILEAGE. Golden State carries loads up to 38 tons in twenty-four-hour-a-day operation. With retreading, their vehicles average in excess of 175,000 miles on nylon cord tires. Truckers find nylon casings strong enough to be retreaded again and again for thousands of safe, extra miles.

THIS FLEET OPERATOR REPORTS:

"NYLON ENDED BLOWOUTS DUE TO TIRE CORD FAILURE"

J. J. Burke, Operations Superintendent for the large truck fleet of the Golden State Division of Foremost Dairies, reports: "Before we switched to nylon cord tires, we were having a lot of blowouts due to sidewall bruise damage—especially in areas where trucks had to leave the highway for ranch pickups. With nylon cords, we haven't had a single blowout due to sidewall failure; and believe me, when we're trucking 38 tons of perishable milk through 105-degree temperatures, we really need that dependability."

PROVE TO YOURSELF that the advantages of nylon cord tires add up to big savings under any road and load condition. Ask your dealer about nylon cords today. Du Pont makes the tough, long-lasting nylon. Nylon cord tires are available from all tire makers.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

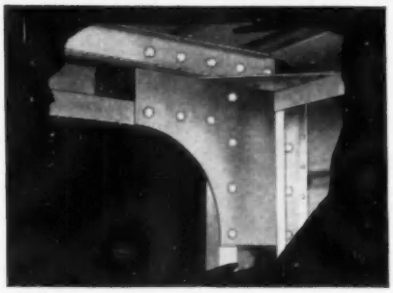
FOR TRUCKS AND PASSENGER CARS, TOO . . .
THE STRONGEST, SAFEST TIRES ARE MADE WITH NYLON CORD

Protect Your **PROFIT** *Margin . . .*

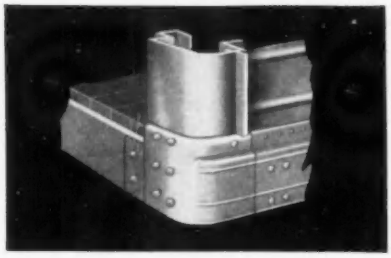
ELIMINATE DEADWEIGHT

UP TO 1,500 lbs. Less Deadweight In Brown *Aluminum* Bodies

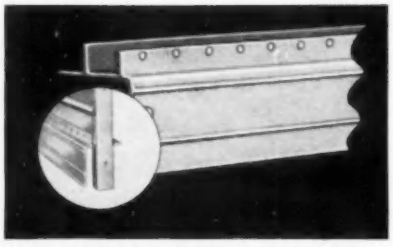
GET *Exclusive* BROWN FEATURES



CORNER GUSSETS . . . An integral part of the Brown Aluminum Body design. The longerons, headers and corner posts are interlocked and ruggedly gusseted to provide the greater structural strength to withstand greatest over-the-road strains and stresses—eliminate wracking.



RUGGED CORNER CASTINGS . . . Another exclusive Brown Aluminum Body feature. Heavier, sturdy wrap-around design that is wrackproof. In assembly with Brown-engineered and "stress" designed rigid corner posts, corner casting withstands the greatest corner impact . . . eliminates costly corner post repairs and replacement.



SUPERIOR RUB RAIL CONSTRUCTION . . . Brown's construction method excludes any possible electrolytic action at all critical points. Eliminates corrosion—the chief cause of deterioration in many types of body construction. Another exclusive Body Assembly feature is Brown's aircraft quality "stressed-skin" riveted construction with rolled Z-Stiffeners which add great strength.

Sales & Service Coast-to-Coast
BROWN ALUMINUM BODY BUILDERS

You'll Save Time . . . Save Money

Brown Lightweight Aluminum Bodies eliminate deadweight hauling . . . weigh up to 1,500 pounds less than other type bodies. You'll save on gas and oil . . . speed up delivery . . . take a load off the truck's engine . . . save on tire wear, as well as brakes. Brown custom designed parts are mass-produced to give you the advantage of factory-quality, production pricing. Fully-equipped, independent Brown Dealers have the body building facilities and service to aid you . . . right in your own community. So, for lowering your operating and maintenance costs . . . increasing efficiency . . . standardize on Brown Aluminum Cargo Van Bodies for increased PAYLOAD PROFIT! Yes, whatever your hauling problem . . . dry freight or perishables—Better Buy Brown Aluminum Bodies, your best buy!

Standardize . . . Modernize . . . Economize

CARGO VAN DIVISION BROWN TRAILERS, INC.,
SPOKANE, CHICAGO, READING

Brown aluminum cargo-van bodies

BROWN TRAILERS, INC., SPOKANE, Wash

☐ Send us latest literature

☐ Have your representative call on us

Company Name_____

Street_____ City_____ State_____

New Products

Continued from Page 188

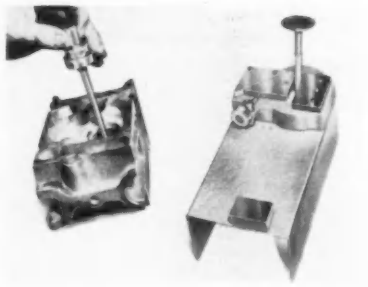
P17. Truck Hoists

Lundell Mfg. Co., Cherokee, Iowa, is now marketing truck hoists in three models. All three are front mounts and offer 5, 8, or 10-ton capacities with normal dumping angles and average lifting times. Mounting clearance is about 11 in. on the 5 and

8-ton models; about 13 in. on the 10-ton hoist. There is no increase in mounting height and longsills of wood or steel are used. A relief valve built into the 4-piston pump by-passes on dangerous overloads with operating pressures to 2000 lb.

P18. Valve Gage

Tobin-Arp Mfg. Co., Minneapolis, Minn., is now marketing a valve guide gage. This gage measures the difference between the size of the valve



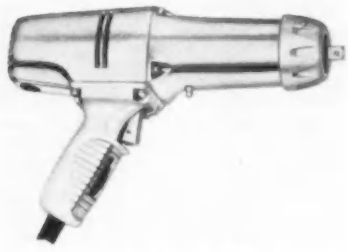
stem O.D. and the valve guide I.D. According to the manufacturer, the gage will help spot worn valves and valve guides by indicating excessive guide clearance.

P19. Fender Flaps

Buxbaum Co., Canton, Ohio, now offers truck and trailer fender flaps featuring individual company names molded in raised letters into the flaps. The flaps are rubber, impregnated with tire cord for extra strength. Branded names on flaps discourage pilfering and help promote company name while trucks are on the road. Flaps meet all state codes.

P20. Impact Wrench

Portable Electric Tools, Inc., Chicago, announces an electric impact wrench which features a neoprene-steel energy accumulator. The torque



may be adjusted to fit the job requirements by twisting the calibrated nose cap of the wrench. According to

(TURN TO PAGE 196, PLEASE)

"I wish I'd done it 2 years ago . . .

MOTOROLA 2-WAY RADIO STARTED BOOSTING PROFITS THE DAY IT WAS INSTALLED"

"2 years ago I felt handcuffed, watching my competitors building up their business while we were left at the post . . . listening to customers complain and eventually drift away. I had heard of 2-way radio, but I was "on the fence" about it. Others were using it and actually taking my customers away from me with better service.

"So I decided to take the plunge—and that turned out to be the happiest business day of my life. Motorola 2-way radio cuts costs a dozen ways and gets more work from every truck. Single handed, it has taken our hit-and-miss operation and made it into a smooth-functioning, profit-making unit.

"With better service we're keeping our present customers and winning many of the old ones back. News gets around and we're putting new customers on our books every day. I was pretty late in discovering 2-way radio, but now it runs a close second to trucks as the most important tool in our organization. Before I invested, I learned that Motorola furnishes more 2-way radio than all others combined. The reasons become more obvious after using it for 2 years."

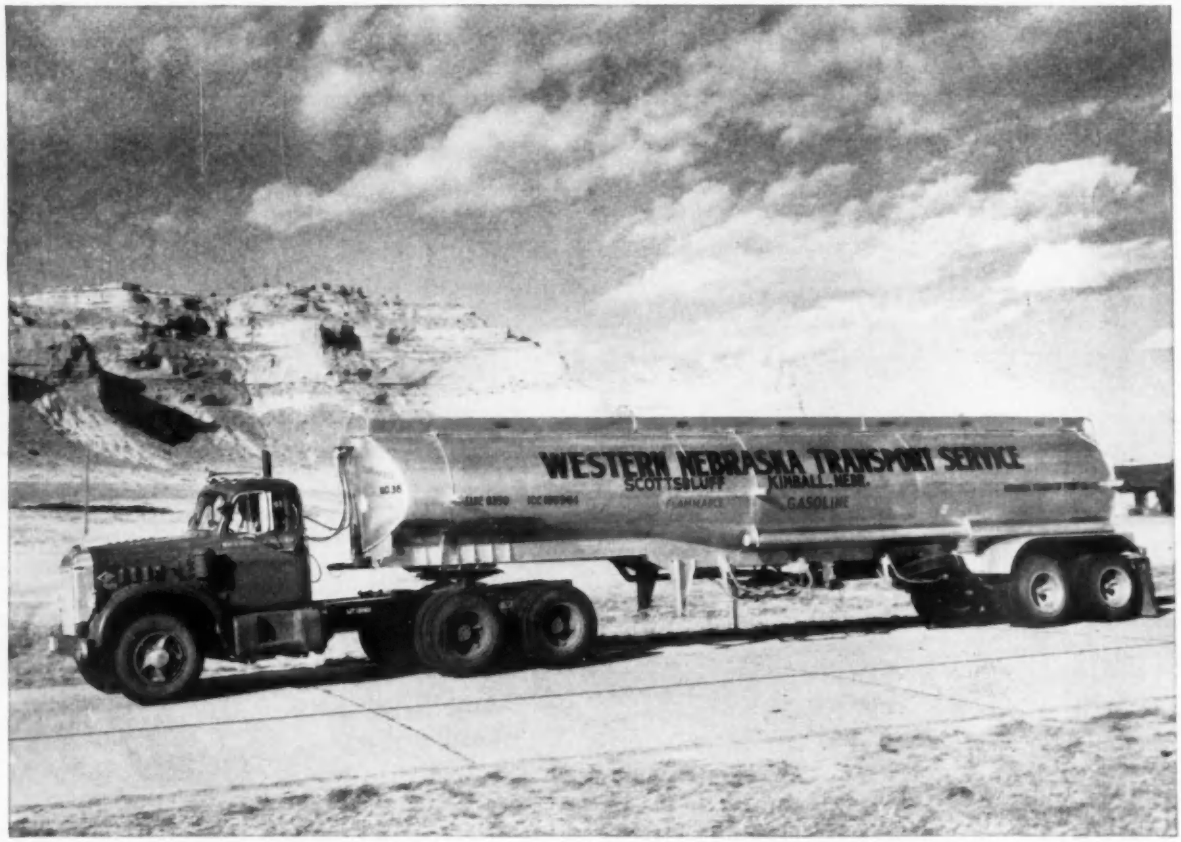
Write, phone or wire TODAY

MOTOROLA

2-WAY TRUCK RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
A SUBSIDIARY OF MOTOROLA, INC.
4501 AUGUSTA BOULEVARD • CHICAGO 51, ILLINOIS

Motorola consistently supplies more mobile and portable radio than all others combined.
Proof of acceptance, experience and quality.
The only COMPLETE radio communications service—specialized engineering...product...customer service...parts...installation...maintenance...finance...lease.
"The best costs you less—specify Motorola."

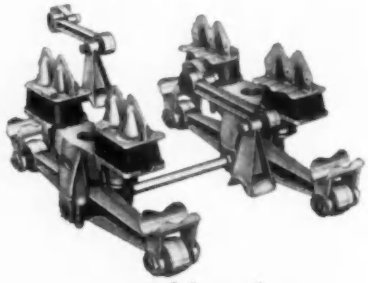


"Not 1¢ maintenance in ½-million miles..." on Western Nebraska's Hendrickson tandems

"In almost ½-million miles covered by our 5 new Diamond T Diesel Tractors, we haven't spent a red cent for maintenance on any Hendrickson Suspension. They just keep on giving dependable, low-cost performance, month in and month out . . . help keep our rigs rolling with big payloads on tight schedules," says Earl Houk, President of Western Nebraska Transport Service, Scottsbluff, Nebraska.

"Another advantage," adds Mr. Houk, "is the light weight. The Hendrickson RSAA-320 with aluminum beams and saddles, combined with aluminum components in the tractor chassis, trim tare weights, boost our payloads, increase revenue. I recommend Hendrickson rubber cushion suspensions to other truckers as most reliable, most trouble-free for an operation of our type."

Hendrickson's *rubber* "load cushion," an innovation in tandem suspension, is designed to give a soft, easy ride during the entire range from empty to full load. Forged aluminum equalizer beams effect a 50% weight saving. The 4-point frame mounting eliminates concentration of stresses at any one point on the frame. Call Hendrickson now for complete information on your application.



HENDRICKSON Mfg. Co.

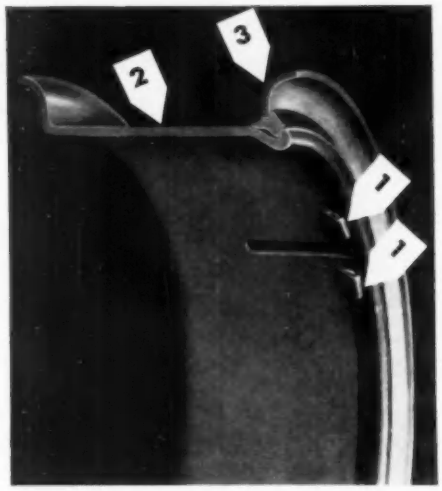
HENDRICKSON MFG. COMPANY
8001 WEST 47th STREET
LYONS (Chicago Suburb), ILLINOIS

Announcing Cleve-Weld's new Lightweight Rim!

Built by men with 45 years of experience in the problems of fleet operators, the New Cleve-Weld Lightweight Rim is designed to set and maintain new standards in truck rim performance! You'll save on original installation costs, earn by reduced unsprung weight, keep rolling safely and surely.

Three-way reduction in rim weight:

1. **"Extra-Metal" drive plates now "Same-Metal"**
   Cleve-Weld engineers make two simple depressions in rim base do work of bulky "forged" drive plates.
2. **Rim Base re-engineered for lightness**
   Excess metal is strategically shaved off the rim base! Rim is lighter in weight without loss of safety or efficiency.
3. **Side-Ring reduced in thickness**
   We've engineered this section without loss of efficiency, eliminating more unsprung weight for you.



The New lightweight rim from Cleve-Weld offers you these immediate benefits:

1. Significant savings in original installation costs starting with your first order.
2. More earning power per truck due to less unsprung weight per rim.
3. Safe, sure roadability under any road conditions.
4. Minimum time lost during tire changes with easy-handling rim components.

Write us today or see your parts and service suppliers to get the full story on the new Cleve-Weld Lightweight Rims.

Another AMF Product
CLEVE-WELD PROCESS
RIMS · RINGS · WELDMENTS

CLEVELAND WELDING DIVISION
AMERICAN MACHINE & FOUNDRY COMPANY
Cleveland 11, Ohio

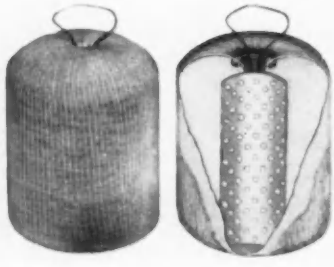
New Products

Continued from Page 192

the manufacturer, a special design enables the accumulator to absorb shocks of impact usually transmitted to the operator. The wrench has from ⅝ in. to ½ in. bolt capacity; from 105 to 275 ft lb torque range; and delivers 1600 to 1800 impacts per minute.

P21. Filter Cartridge

Refill Filter Co., Newark, N. J., is now marketing a sock type oil filter replacement cartridge, which carries a guarantee of 5000 miles of efficient



oil filtering. The filter features built-in center post oil seal washers which prevent by-passing and a "spun-wound" cotton thread core which, according to the manufacturer, eliminates channeling and collapse of the filter.

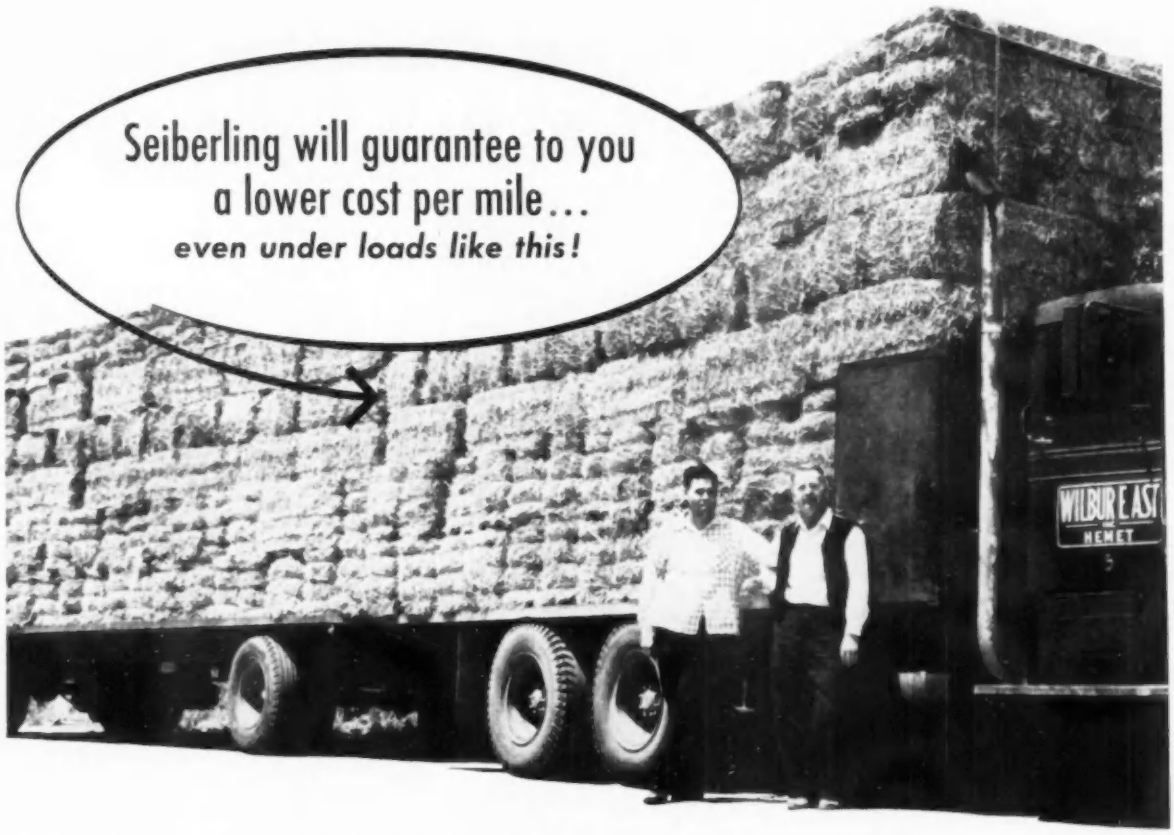
P22. Wrench Kit

Braden Winch Co., Broken Arrow, Okla., has introduced a winch kit designed especially for front end installation on GMC series 100 four-wheel or two-wheel drive chassis. The kit consists of an 8000 lb capacity winch with all necessary mounting and driving parts.

P23. Aluminum Solders

Aluminum Co. of America, Pittsburgh, Pa., has announced two high temperature soldering materials. A high zinc solder which is 95 per cent zinc and 5 per cent aluminum, will, according to the manufacturer, join all aluminum alloys and make joints between aluminum and other metals. The solder has a melting range of 715

(TURN TO PAGE 200, PLEASE)



That's guaranteed, and here's why:

- Seiberling's affinite tread resists cutting
- Thermoweld construction gives super-bonding
- Heavy-duty beads guard against bead failure
- Full squeegee construction provides added impact resistance
- Seiberling's special nylon cord construction minimizes growth

READ WHAT A USER REPORTS:

"My Kenworth 250-Diesel truck is equipped with a large Timken dual drive unit that is most sensitive and requires very close matching of duals.

"After one-third tread wear at 67,000 miles, we checked the Seiberling Lug Highways and found them within tolerance and with a minimum of growth. Because of our ability to return them to drive-wheel service, I highly recommend these tires, especially where dual drive units are concerned."

Wilbur E. Ast,
WILBUR E. AST, INC.
Hay and Straw Wholesale
Box 137, Hemet, California

Seiberling will guarantee to you, in writing, a lower cost per mile than any tire of any make you have ever used. And we'll prove it to you on your fleet. Just send in the coupon.

Mr. L. M. Seiberling
Vice President in Charge of Sales
SEIBERLING RUBBER COMPANY
Akron 9, Ohio

Name_____ Title_____

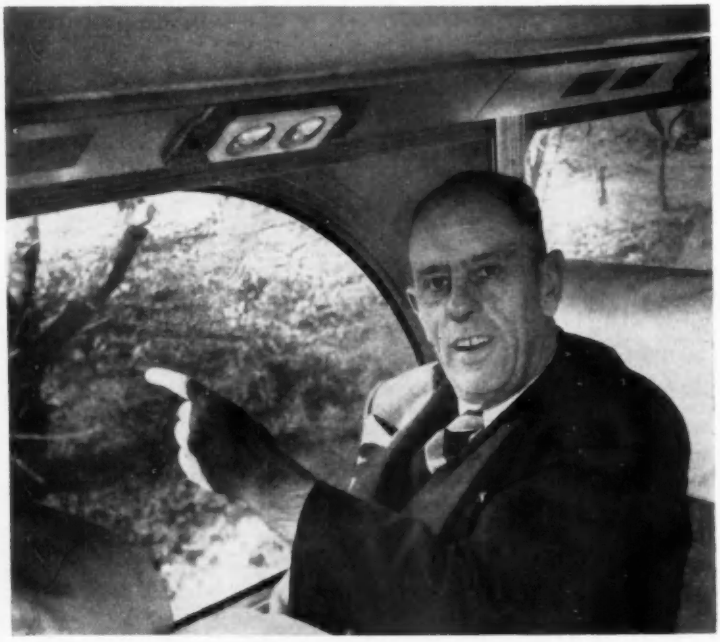
Firm Name_____

Street_____

City_____ Zone____ State_____

SEIBERLING
RUBBER COMPANY
AKRON 9, OHIO

"SOLEX® reduces driver fatigue— adds comfort for passengers,"



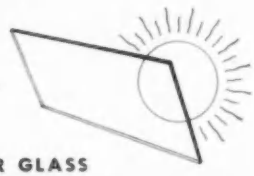
says owner of
Chatham Coach Lines

Standing in front of one of his buses is Mr. J. Ivan De Nure, owner of the Chatham Coach Lines, Chatham, Ontario, Canada. He frequently drives this bus himself, so he has first-hand information on SOLEX Safety Glass. Here's what he says about it: "SOLEX Glass reduces driver fatigue, adds comfort for passengers—the type of comfort that has resulted in a definite pick-up in business."

The passenger pictured here, Mr. T. M. S. Kingston, agrees with the owner's statement: "In this bus, I can read comfortably. I was never able to concentrate on reading in the past, because of the glare that came through the window. This tinted glass also cuts down the heat in the summer."

SOLEX Safety Glass reduces the amount of solar heat and glare entering buses. Therefore, it makes driving easier and safer . . . makes riding more comfortable. Specify SOLEX for new equipment and as a replacement in your present buses and trucks.

SOLEX is available in the well-known types of Pittsburgh Safety Glass—DUPLATE® and DUOLITE®—as well as in HERCULITE® and conventional plate glass. For more information, write to Pittsburgh Plate Glass Company, Room 7302, 632 Fort Duquesne Boulevard, Pittsburgh 22, Pennsylvania.



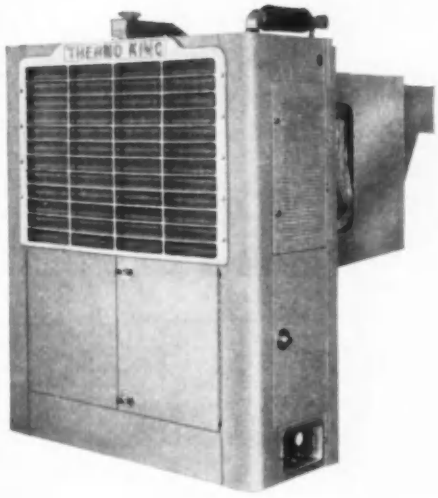
SOLEX® "the best glass under the sun!"

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS · FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

not an extra pound to spoil the picture



We mean your *profit picture.* When you are hauling payload, every pound counts.

Lightweight Thermo King hasn't an extra pound anywhere—some models weigh as little as 445 pounds.

Because it is made of tough, lightweight aluminum, because it is a single self-contained package, and because it is the most compactly engineered unit on the market . . .

THERMO KING

TRUCK REFRIGERATION

Weighs Less

NATIONWIDE SERVICE: Thermo King service stations on all important truck routes in United States, Canada and Mexico

THERMO KING CORP., 44 S. 12th ST., MINNEAPOLIS 3, MINN.

New Products

Continued from Page 196

deg to 725 deg F and works most effectively when preplaced in or near a joint rather than being fed manually. A new soldering flux which can be applied dry or as a 70 per cent flux reacts to weld aluminum with zinc at 720 deg F. It can be removed by flushing with water heated to 180 deg F.

P24. Lamp Adaptor

Do-Ray Lamp Co., Chicago, is now marketing a lamp adaptor. According to the manufacturer, the resilient molded rubber base is designed to fit

the contour of all new streamlined truck bodies and is especially adaptable to the straight body line of 1957 Ford trucks. The adaptor is marketed with an all-purpose 3-in-1 marker, clearance and fender lamp, but it is also available separately for use with curved lamp designs unadaptable to straight body cabs.

Classified Advertisements

AUTOMOTIVE FUEL TANK REPRESENTATIVES WANTED. LEADING MANUFACTURER OF COMPLETE LINE OF UNDERWRITERS APPROVED FUEL TANKS REQUIRES REPRESENTATIVES TO COVER MAJOR MOTOR TRUCK, FARM EQUIPMENT AND TRACTOR MANUFACTURERS. RARE OPPORTUNITY FOR AN AGGRESSIVE SALESMAN OR SALES COMPANY. ALL REPLIES IN STRICTEST CONFIDENCE. BOX 11, COMMERCIAL CAR JOURNAL, 5601 CHESTNUT STREET, PHILADELPHIA 39, PA.

COORDINATOR SERVICE PARTS. SIX YEARS WITH MAJOR U. S. OIL COMPANY. RECENTLY RETURNED FROM OVERSEAS ASSIGNMENT. ADMINISTERED ALL PARTS FUNCTIONS APPLICABLE TO AUTOMOTIVE, MARINE CONSTRUCTION, OIL DRILLING AND SHOP EQUIPMENT. ENCOMPASSED 15 MILLION DOLLAR PROGRAM. LIAISON WITH ZONE OF OPERATIONS, MANUFACTURERS, U. S. AND EUROPE. COORDINATED STANDARDIZATION, NON-DOLLAR PROCUREMENT, STOREHOUSE OPERATIONS AND PROCEDURES APPLYING TO MULTI-MILLION DOLLAR INVENTORY. RESUME ON REQUEST. T. J. DALTON, 2704 GLENWOOD ROAD, BROOKLYN, N. Y.

Driving dead axle on tandem-axle trucks is simple, safe, economical with Gates Tandematic Drive

This drive consists of two Roll-On Pulleys and a Rib-Top V-Belt mounted between dual tires on each side of truck.

The drive transmits power from driven axle to the dead axle on both tag and pusher type trucks and tractors. There is no inter-axle drive line . . . only the original gear-driven rear axle assembly.

With four wheels driving instead of two, trucks have up to double the traction and can be kept rolling in all kinds of weather. Practically eliminates the need to "chain-up" on slick, icy roads.

In fair weather, too, the Tandematic Drive has marked advantages: Users state that road shock, wheel hop and jerking are reduced — prolonging the life of vital truck parts, from tires to the engine, as well as giving better control with less driver fatigue . . . greater safety.

Tire wear is evenly distributed over all eight tires — greatly increasing the average tire life.

In addition to substantial savings on tires and maintenance, Gates Tandematic Drive saves as much as $1000 in initial cost over some other types of tandem-axle drive.

And finally, you get the advantages of driving both axles *without* a heavy increase in chassis weight . . . a saving of hundreds of pounds in chassis weight permits additional payload that brings in hundreds of extra dollars per year in revenue.

Here's how Gates Belts are easily installed under proper tension

Pulley is held in place by one nut, and groove is offset by T-wrench or jackscrew.

. . . about seven feet to roll belt into grooves

Rib-Top V-Belt is laid in pulley grooves.

. . . safely installs belt at proper operating tension.

With no one touching belt, truck is driven

When outside wheels are installed, truck is ready to roll. →

Gates

SEE INSIDE PAGES

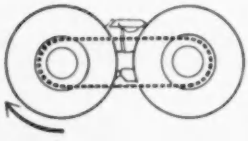
Gates Tandematic Drive

Driving Dead Axle Doubles Traction

...and Provides 5 Other Major Advantages

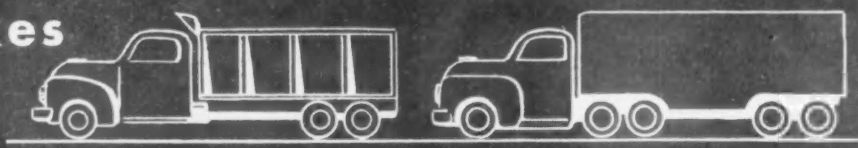
- Equalizes tire wear — cuts your tire cost-per-mile.
- Absorbs shock of wheel hop — minimizing vibration throughout the truck, thus prolonging life of parts and cutting maintenance costs.
- Eliminates backlash — by preventing "speed up" of driver wheels —prolonging life of differential, universal joints, transmission and clutch.
- Greatly improves braking — provides faster, smoother stops; increases safety.
- Keeps trucks rolling — year-around in all kinds of weather.

For tag axle



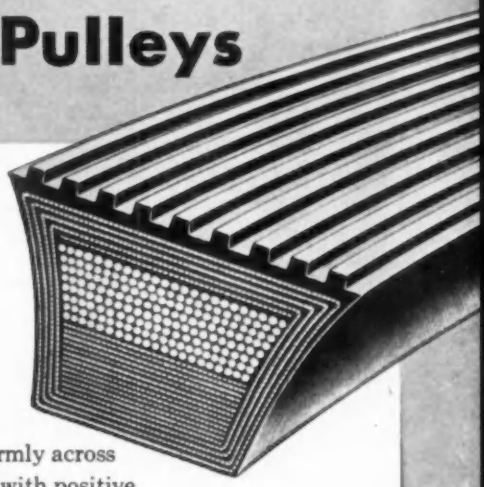
... or pusher axle

...on all makes of trucks



gives you both..

✓long-life Rib-Top V-Belt
✓self-cleaning Roll-On Pulleys



✓Rib-Top V-Belt
(U.S. PAT. NOS. 2519590 & 2274515)

- **Protective ribbed top:** Resists sand-blast effect between wheels — assures maximum service life.
- **Special tensile cord construction:** Greater resilience of Gates tougher tensile cords enable belt to absorb shocks and carry extra heavy loads. Also enables the belt to be pre-loaded during installation to the proper operating tension.
- **Concave Sidewalls:** Precisely engineered concave sides fill out as belt bends to fit exactly in groove so wear is distributed uniformly across full width of belt with positive, non-slip grip.
- **Flex-Weave Cover:** Protects vital core of belt from mud, dirt, grease and oil; yet gives greater flexibility for longer service life.

✓Roll-On Pulley
(PAT. PENDING)

- **Offset feature:** Split construction permits pulley groove to be offset with jackscrew so belt can be rolled on at high tension easily and safely.
- **Ductile iron construction:** Strong, flexible and tough to give many thousands of miles extra service.

For Disc Type Wheels

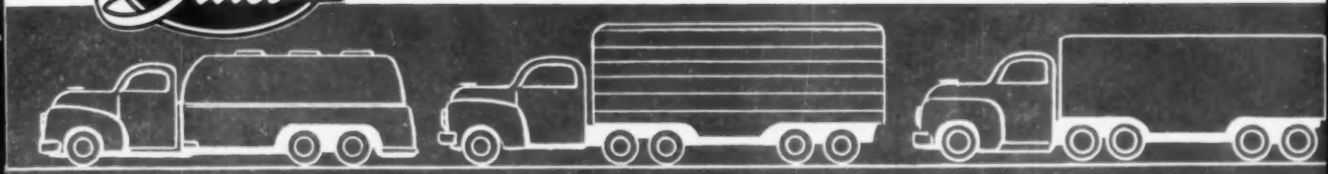
For Spoke Type Wheels

TPA 249

- **Self-cleaning design:** Open design of pulley groove prevents dirt and snow from interfering with performance of the belt.

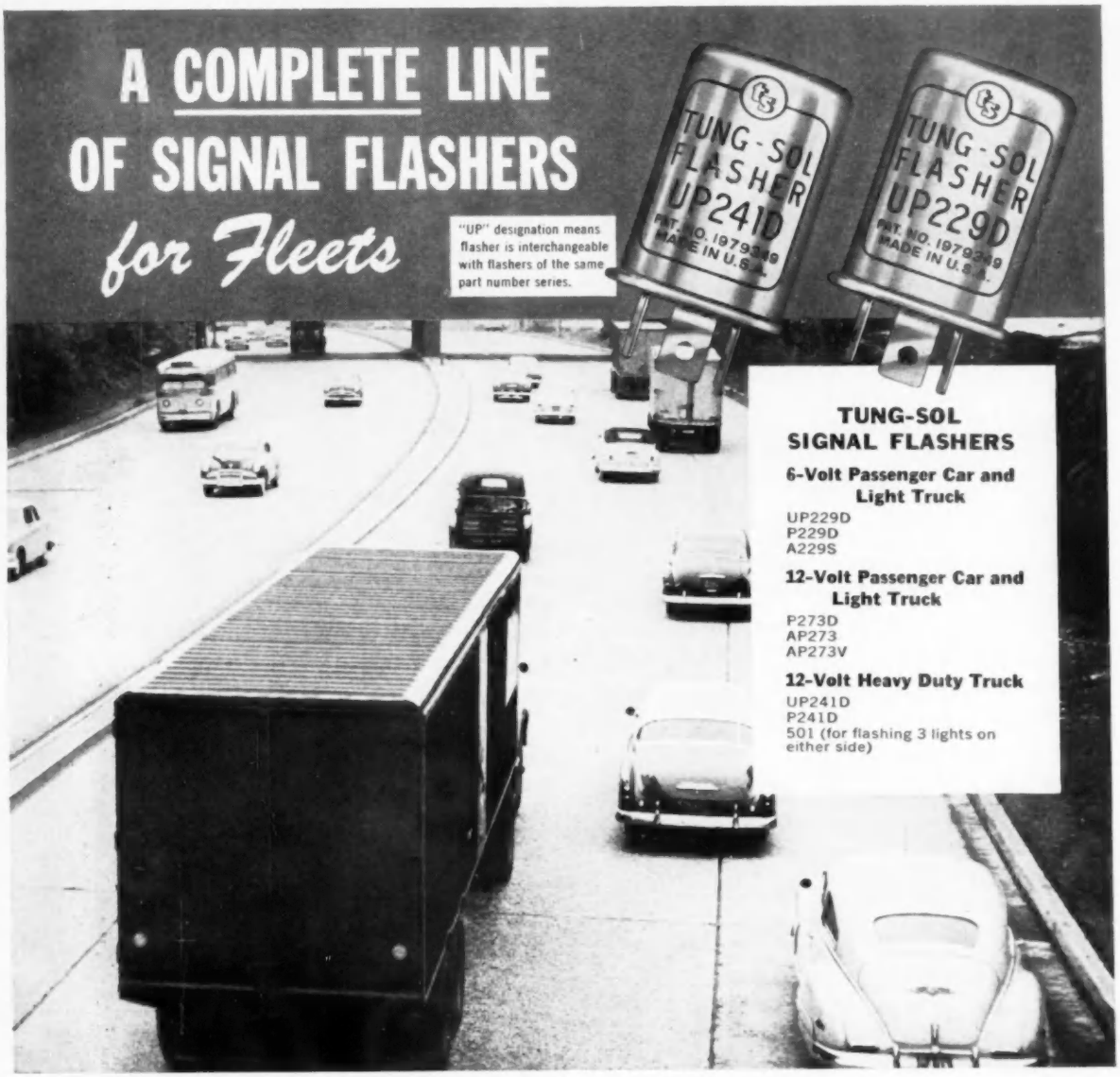
The Gates Rubber Company, Denver, Colorado

Gates — The Mark of *Specialized* Research



A COMPLETE LINE OF SIGNAL FLASHERS *for Fleets*

"UP" designation means flasher is interchangeable with flashers of the same part number series.



TUNG-SOL SIGNAL FLASHERS

6-Volt Passenger Car and Light Truck

UP229D
P229D
A229S

12-Volt Passenger Car and Light Truck

P273D
AP273
AP273V

12-Volt Heavy Duty Truck

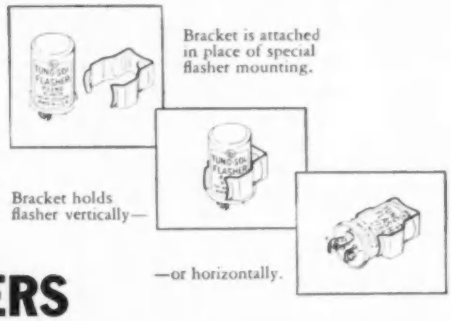
UP241D
P241D
501 (for flashing 3 lights on either side)

Whether your fleet is passenger cars, light trucks or the big jobs, the line of Tung-Sol Flashers contains every type you need for signal system service.

Tung-Sol Flashers are the same flashers the overwhelming majority of vehicle manufacturers specify as initial equipment.

Insure the signalling reliability and dependability your fleet must have. Replace with Tung-Sol Flashers!

Tung-Sol Electric Inc., Newark 4, New Jersey.

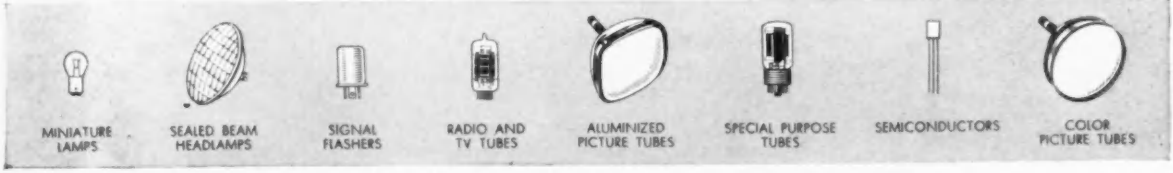


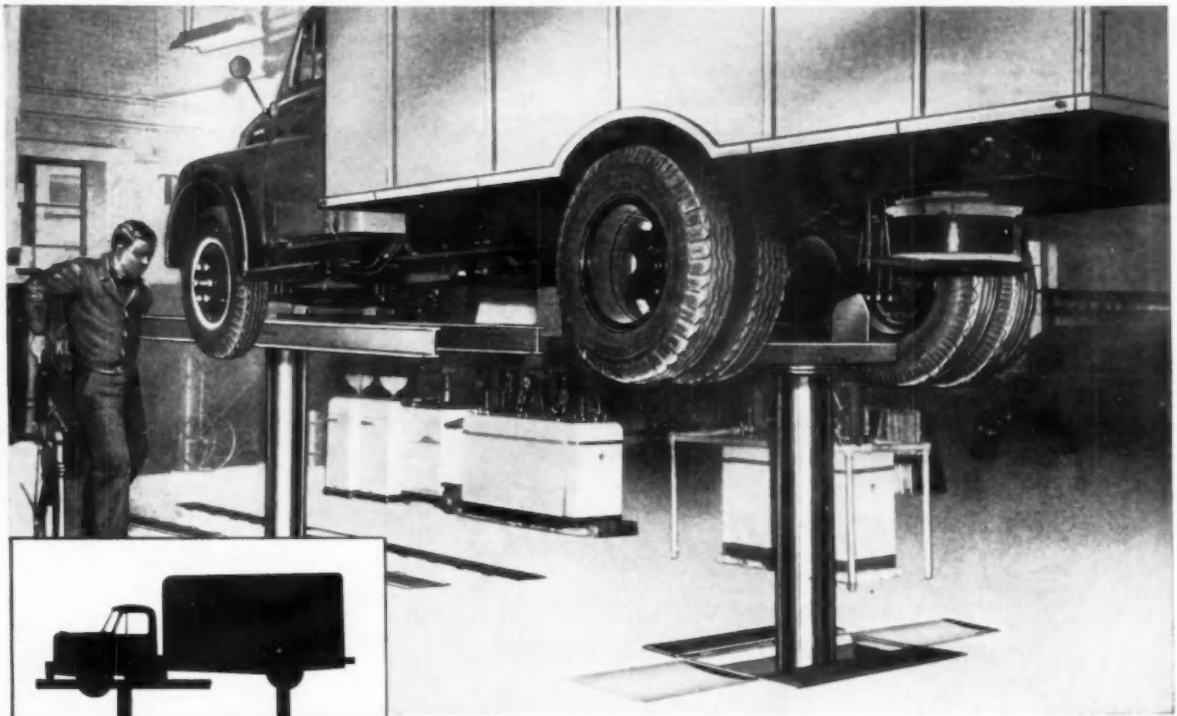
Bracket is attached in place of special flasher mounting.

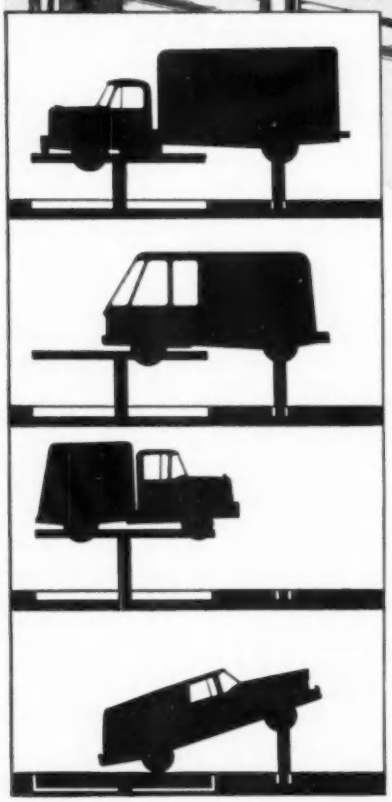
Bracket holds flasher vertically—

—or horizontally.

TUNG-SOL SIGNAL FLASHERS







FOR COMPLETE VERSATILITY, GREATER PROFITS . . .

USE A GLOBE SLR (2-POST HEAVY-DUTY MODEL) HOIST

Here's the most versatile Hoist you can own—a 2-post heavy-duty truck Hoist with a lifting capacity of up to 40,000 lbs! The "Universal" Hoist handles a full range of vehicles . . . can service two light trucks or cars at the same time, since each post can be operated independently. Free-wheel construction provides more underbody working space . . . speeds repair jobs.

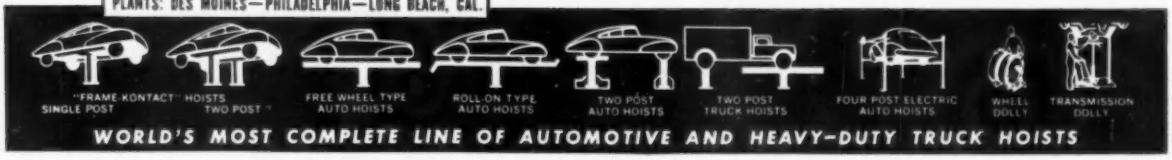
Cylinders can be located to allow for wheelbases up to 240". Installation may be flush-floor or recessed. The full hydraulic "Universal' Hoist can be operated either from an air compressor or by Globe Electric-Oil unit. Globe cylinder design permits smooth operation even when superstructure load is off-center.

Globe "Universal" Hoists are low cost . . . easy to install . . . economical to operate. It's a Hoist every garage and fleet shop can use profitably to get cars and trucks back on the road faster.

GLOBE®
THE BEST LIFT
TRUCK HOISTS
PLANTS: DES MOINES—PHILADELPHIA—LONG BEACH, CAL.

WRITE . . .

for Globe Hoist's free brochure on truck servicing with Globe Hoists. Here's information you can use to improve your servicing and repair program. Globe Hoist Company, East Mermaid Lane at Queen Street, Philadelphia 18, Penna.



WORLD'S MOST COMPLETE LINE OF AUTOMOTIVE AND HEAVY-DUTY TRUCK HOISTS

July News Roundup

Continued from Page 110

4.98 and the passenger accident rate was 9.93 per cent less than 1955. Top fleets (in their respective population grouping) were (Washington) D. C. Transit System, New Oreleans (La.) Public Service, Gary (Ind.) Transit, (Columbia) South Carolina Electric & Gas, Savannah (Ga.) Transit, Interstate Power Co. (Dubuque, Iowa) and (Charleston) South Carolina Electric & Gas Co.

1957 Domestic Truck Factory Sales by GVW

	6,000 lb. and less*	6,001-10,000*	10,001-14,000	14,001-16,000	16,001-19,500	19,501-26,000	26,001-33,000	Over 33,000	Total
January	42,027	10,018	1,836	7,203	3,514	3,099	2,932	2,579	73,208
February	37,847	11,292	2,391	10,407	3,023	3,139	2,795	2,799	73,693
March	39,622	11,272	2,438	8,362	3,389	2,691	2,935	2,814	73,523
April	39,176	12,954	2,958	13,003	5,713	3,973	3,271	3,362	84,410
4 Mos.—1957	158,672	45,536	9,623	38,975	15,639	13,902	11,933	11,554	304,834
4 Mos.—1956	145,294	56,832	12,672	58,678	18,394	19,222	25,808	**	336,900

* Prior to Jan. 1957, vehicles below 10,001 G.V.W. were grouped as follows: "5,000 and less" and "5,001-10,000."
** Included with 26,001-33,000 group. Source: Automobile Manufacturers Assn.

As a service to fleet operators, recent major laws affecting commercial vehicle operation both bus and truck are digested here. As reported here, the summary serves only as a guide so the fleetman may check the exact wording of the new law (through his state truck association or state capital to see how it affects his operation.

Arizona — Certain requirements as to out-of-state certificates of title are repealed (H50).

California — Common carrier permits not used for one year expire (H482). Common carrier is prohibited from acting also as a petroleum contract carrier (H489). Book of single-trip permits may be issued (HI618).

California also requires household goods carriers to carry $5,000 cargo insurance (S1069). Household goods operating authority fee is now $100 (S1072). Attachments to vehicle combinations may not extend beyond 60-ft length limit (H1802). Exhaust gases may not be directed to side of vehicle between 2 and 11 ft from ground (H1803). Fixing of reduced speed limits for trucks is provided for (H1620). Bond requirements for common carriers and petroleum irregular route carriers are amended (H2928). Passenger stage corporations and street railways are exempt from obligation to provide vehicles and seats (H593). Three-axle trucks and truck-trailer combinations have maximum speed limit of 45 mph, are required to stay in lane nearest right hand curb except under certain conditions (H524). Interstate carriers are required to maintain certain books and records in the state (H487). Vehicles are required to have a mirror giving driver view for 200 ft to rear.

(TURN TO PAGE 210, PLEASE)

7 WAYS TO DECREASE DOWN-TIME...

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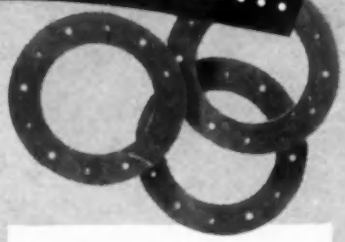
resist high under-hood temperatures, abrasive road dirt, oil and grease. *Pre-stretching* prevents sagging and premature wear.



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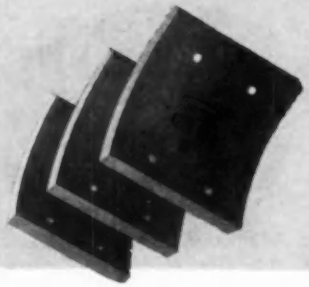

THERMOID BRAKE BLOCKS

are engineered to meet the most rigid stopping tests, while providing maximum mileage, regardless of heat or operating conditions.

Cover By Hoosier Tarpaulin Co.

CANVAS ON THE "GO" – Hancock Trucking Inc. of Evansville, Indiana – which operates almost 500 trailers throughout Central United States – had a claim ratio, last year, of only 44/100% – one of the lowest in the entire country. Since almost 200 of Hancock's trailers are open-backs or flat-tops, the tarpaulins used to protect cargo in transit had to be extremely tough and weather-resistant to maintain such a low claim ratio. The vast majority of tarps used by Hancock are made of cotton duck. Typical of these is the one shown above, made of Mount Vernon duck by Hoosier Tarpaulin and Canvas Goods Co., Inc. of Indianapolis.

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July News Roundup

Continued from Page 206

Colorado—Exemptions are provided for vehicles operated by governmental agencies from ton-mile tax (H110). Government owned or leased vehicles are exempt from vehicle ownership tax (H266). Stopped school bus may not be passed in either direction except by vehicle using other roadway of highway with separate roadways (H22).

Colorado also has increased vehicle inspection fee to not more than $1.50, changed inspection periods to April-May and Oct.-Nov., set standards for authorized inspection stations, provided that owner of 10 or more vehicles operating a shop may inspect his own vehicles.

Connecticut—Turn signals must be turned off after turn is made (S500).

Connecticut also permits commissioner, at his discretion, to license vehicles without lights for daytime operation only (H1691). New law regulates storage and transportation of hazardous chemicals (H2348).

Florida — Minimum following distance between trucks and other vehicles is 300 ft (S100).

Florida also has amended auto transportation company regulation to redefine terms applying to passenger carriers (S584). Railroad Commission regulation of auto transportation companies is provided for (S302, S294, H490). Penalties are provided for motor rule and regulation violations (S297).

Georgia—Vehicle liability insurance required to prevent suspension of driver license or vehicle registration is $10/20/1000 (H12).

Georgia also requires loads of pulpwood be chained or cabled (S119). Pro-rata registration of interstate bus fleets is authorized (H145).

Illinois—Illinois has been advised that Michigan is cancelling the truck licensing reciprocity agreement between the two states.

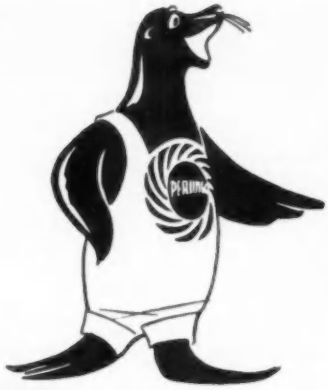
Iowa — Tractor-trailer combination maximum length is 50 ft (H132).

Iowa also now defines a contract carrier as not holding more than five contracts at one time (H469). Compensatory tax is imposed on carriers who do not register a portion of their fleet in Iowa (H484).

Maine—Lights required on rear of vehicles over 7 ft wide must be within 12 in. of extreme rear of vehicle (S546). Length limit is increased to 50 ft; new axle spacing table for determining gross weights is provided (S352). Excise tax exemptions include for-hire motor buses (H884). Maximum speed limit for commercial vehicles is 50 mph (S573). Gross weight and axle weight limit tolerance for vehicles carrying logs and pulpwood except on Interstate System is 10 per cent (S529). State Police inspection of trucks is regulated (H958). Semi-trailers are subject to mudflap requirements (H1010). Interstate bus fee payment on a prorated basis is provided for (H984).

Michigan—Overweight vehicle being driven over most direct route to place where excess weight permit may be obtained shall not be cited for weight violation (H123). Vehicles of 1½ ton or less hauling newspapers are exempt from Motor Carrier Act (S1174). Michigan is reported to have canceled its licensing reciprocity agreement with Illinois. It is re-

(TURN TO PAGE 212, PLEASE)



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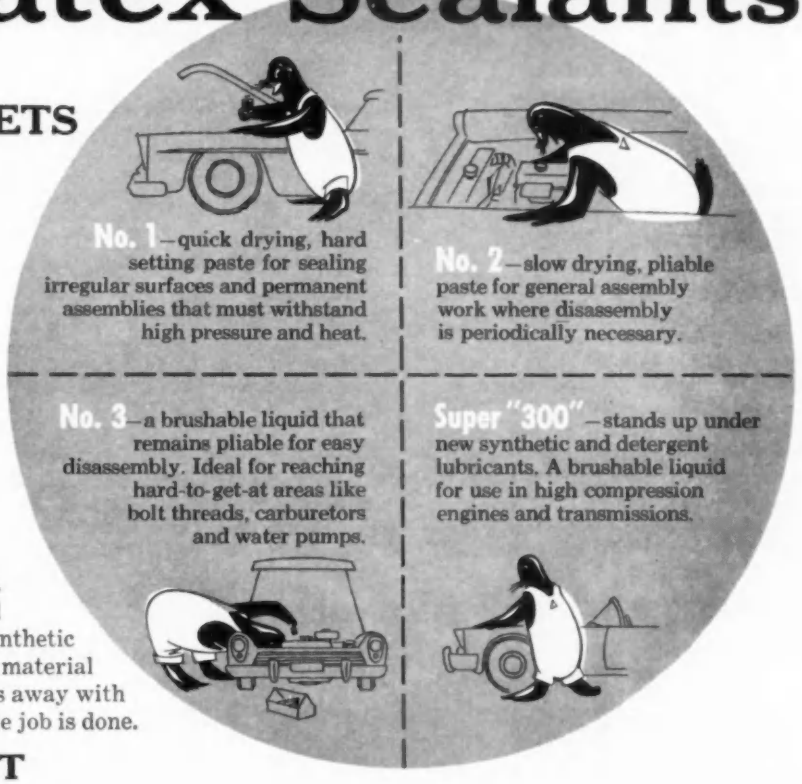

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July News Roundup

Continued from Page 210

ported that Michigan will eliminate as far as possible its spring weight limits.

Nebraska — Motor fuel tax rate goes up to 7¢ (LB375). Buses operating within 6-mile radius of city are exempt from special fuels tax; special fuel users must obtain user license for each vehicle and file monthly tax returns on fuel use; nonresident special fuel users must obtain trip permit (LB217). Height limit is set at 13½ ft with vehicle owner responsible for damage caused by vehicle height over 12½ ft; excess size and weight limit permit procedure is set-up (LB488).

New Hampshire—Duty of driver following an accident is regulated (H233).

North Carolina—Dublin County vehicles must be listed for property tax purposes (H78). School buses painted different color than regular school buses have 45 mph speed limit (H96).

North Carolina also permits operation of vehicle up to 20,000 lb without chauffeur license (H433). Registration fee is increased $1 to finance high school driver training program (H33) "For-hire passenger carrier" and "common carrier of property" have been redefined (H132). Licensing of combinations is amended to permit trailer interchange (S363).

Oklahoma—Registration fees in excess of $1,000 may be paid in semiannual installments (H1025). Brake fluid sold must meet SAE specifications (S286). Registration fees for vehicles over 46,000 lb gross are increased; new axle weight spacing table is provided (H881). New registration fees for urban buses goes from a minimum of $25 to a maximum of $7 a seat for larger buses.

Oregon—New law provides for apportionment of registration fees under reciprocity agreements (H342). Vehicles may be stopped for weight check without presumptive evidence of weight violation (H187). Interstate carriers are authorized keeping records and accounts in another state (S469). Driving so slowly on an arterial highway as to impede traffic is an offense (S53).

Pennsylvania—Minimum net brake horsepower required for commercial vehicle engines is 30, providing vehicle has at least one brake horsepower per 450 lb of gross weight (H846).

Texas—Temporary registration for vehicles making single trip within state is provided for (H333).

Vermont—Weight limits on town and state-aid highways are increased (S53).

Wisconsin—Sanitation truck operation is regulated (H51). Reduced registration fees for vehicles used exclusively for ditching, grading or excavating is provided for (H123).

Chippewa Motor Freight, Inc., Eau Claire, Wis.—to 30 drivers with from one to 14 years without accidents.

Campbell "66" Express, Inc., Springfield, Mo.—to 301 drivers with a combined total of 1670 accident-free years.

Dana Trucking Co., Lowell, Mass.—to 29 drivers. Eight men had five-year records averaging 300,000 miles for the period.

Branch Motor Express Co., New York City—to 254 drivers with safe driving records of from one to 14 years.

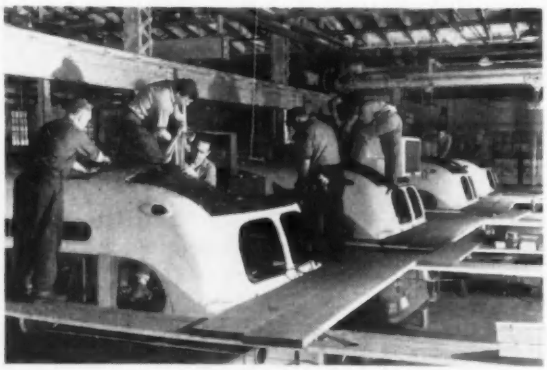
Ringsby Truck Lines, Denver, Colo.—to 15 drivers. Top man had 10 years and 960,000 accident-free miles to his credit.

Brentwood Motor Coach, Pittsburgh, Pa.—to 19 drivers with a combined total of 176 years of safe driving. Seven men had 10 or more accident-free years.

Silver Fleet Motor Express, Louisville, Ky.—presented engraved watches and trophies to drivers E.W. Ellis and C. P. Schneck for 22 years of safe driving and other awards to a total of 106 road drivers.

(TURN TO PAGE 214, PLEASE)

Cool St. Louis



100 buses are being air-conditioned by St. Louis (Mo.) Public Service Co. on this assembly line set up in the transit fleet's general shops. One completed bus comes off the line each day, ready for use on the company's express bus lines this summer.

High Style Dodge

Dodge introduces a high style pick-up truck for delivery and service use. The truck features the swept wing design of 1957 Dodge passenger cars, chrome bumpers and wheel covers, and two-tone colors as well as push button driving controls with automatic transmission and a load capacity of 1675 lb. It is available with 204 hp V-8 or 120 hp 6-cyl.

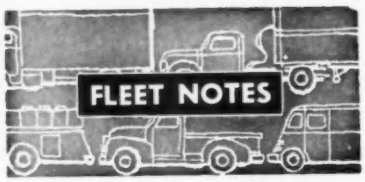
July News Roundup

Continued from Page 212

Briggs Transportation, St. Paul, Minn.—to 88 drivers with from one to seven years of no-accident driving.

Overland Express, Woodstock, Ont., Canada—to 198 highway and city drivers at the company's terminals in the U. S. and Canada.

Follmer Trucking, Danville, Pa.—to 142 drivers. Top man had a 20-year record, nine others had from nine to 19-year safety records.



St. Louis (Mo.) Public Service is now conducting an essay contest for families of its employees. Savings bonds will be awarded to the six best 100-word statements on "Why I want the Public Service member of my family to be safe on the job and also avoid accidents off the job."

G. H. Becker, operations manager of **Murphy Motor Freight Lines,** Minneapolis, Minn., has been elected chairman of the Operations Council, American Trucking Assns.

Great Southern Trucking Co. now offers trailer-on-flatcar service between Jacksonville and Miami, Fla. in a joint operation with the Florida East Coast Railway.

Aero Mayflower Transit Co. has ap-

pointed **Arnette-Holden Transfer & Storage Co.** as its agent in Murfreesboro, Tenn.

Cabell Cornish has joined **Great Southern Trucking Co.**, Miami, Fla. as vice president and director of operations. He was formerly general manager of **Hoover Motor Express**, Nashville, Tenn.

Eastern Express, Inc., Terre Haute, Ind., has announced **James Fisher** as district safety supervisor, Eastern division, and Maurice Fitzgerald as the same in the Central division.

Roy D. Schlegel, head of the **Post Office Department's Division of Vehicles**, has been awarded the "Career Service Award" from the National Civil Service League.

Spector-Mid-States has established a new Research and Development division. It is headed by **Robert E. Shylin**, former vice president of operations of the recently-merged Mid-States organization.

Eldredge Storage Co., Atlantic City, N. J. received an award recognizing its more than 70 years in vehicle transportation at the annual convention of the New Jersey Motor Truck Assn.

Carl Carson Co., Memphis, Tenn. is a newly organized truck leasing and rental firm. The company also provides passenger car rental service.

Sun Oil Co., Philadelphia, Pa. has added 22 International V-225 tractors to its marketing fleet.

McBride Transportation Inc., Goshen, N. Y. has added 40 new Mack tractors with Thermodyne engines, increasing the all-Mack fleet to 141 units.

Thompson Service Sales and **Toledo Steel Products** divisions of Thompson Products, Inc., Cleveland, Ohio, have opened a new branch warehouse at 4073 New Court Ave., Syracuse, N.Y.

Thermo King Corp., Minneapolis, Minn., has named **Illinois Auto Electric Co.** as sales and service dealer for the greater Chicago area.

Highway Trailer Co., Edgerton, Wis. has named **Maier-Schule GMC, Inc.**, as distributor for Buffalo and western New York.

International Harvester Co. has opened a new sales and service branch at 1747 East Charter Way, Stockton, Cal.

Cummins Diesel Sales Inc. is the new Cummins distributor in St. Paul, Minn., and Minot, N.D.

Ammco Tools, Inc., N. Chicago, Ill., has named **Larry Murphy** as sales representative in Minnesota, North Dakota, and parts of South Dakota, Wisconsin and Michigan.

Hendrickson Mfg. Co., Lyons, Ill., has appointed Ralph T. Butler, Springfield, Mo. as Southwest sales and service representative.

International Harvester Co., Chicago, now offers LP gas fuel systems on its V-401, V-461 and V-549 engines. The LP equipment includes **Century** carburetors and **Holley** governors and pressure ignition controls.

J. B. E. Olson Corp., New York City, has appointed **Russell W. Ewbank** as Pacific Coast regional manager with offices in Los Angeles, Cal.

Index to

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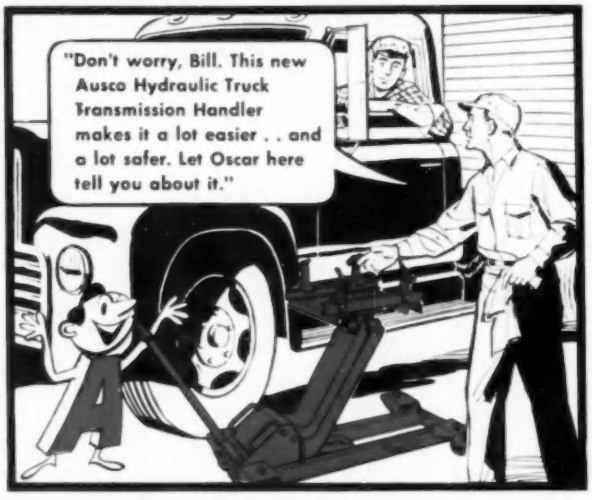

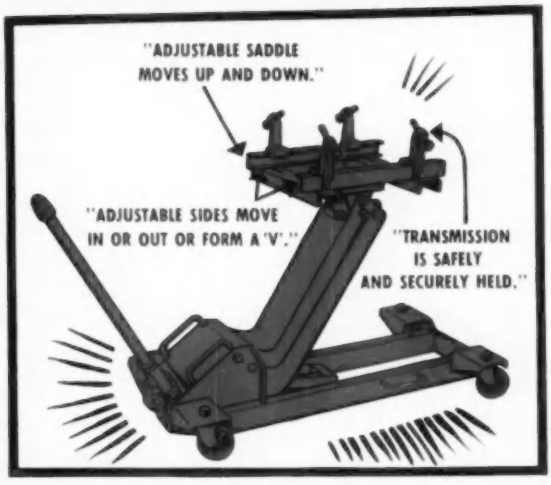

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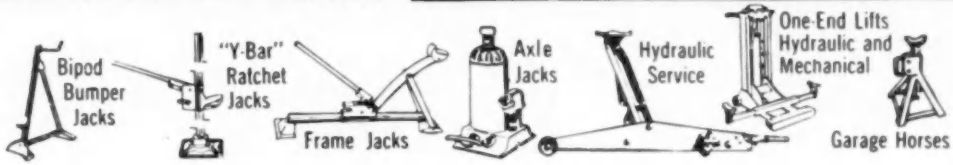

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